<u>EERRANT</u>

#### NEWS IN BRIEF

#### **Productivity** talks at ICL

A MEETING between ICL and union representatives earlier this week considered proposals for the next self-financing productivity scheme. The present scheme finishes in September, at the end of the company's finan-

It is believed that the unions will be seeking a number of important changes to the scheme, if it is to continue, including the consolidation of bonus payments into basic pay.

#### Takeover

EXPANDING South-Coast bureau, Jackson Associates of Chichester, has taken over another company in the town, PS Computing Services. The turnover of the new combined concern will be roughly £1 million in 1978. Jackson Associates recently bought Scope Computing Services (CW, July 13).

#### DEC profits up

CONTINUING to grow at an impressive rate, Digital Equipment has reported worldwide sales of \$1,426 million for its 1978 financial year ended July 1, an increase of 36% over the previous year. Net profits were also up — from \$108 million to \$142

#### NCC appointments

THE names of the remaining members to be appointed to the Technical Advisory Committee of the National Computing Centre have been announced. They are: Reg Boot, NCC develop ment director; John Leighfield, director of systems at Leyland Cars; Professor David Aspinall from UMIST; and John Pearce, managing director of Insac,

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## CDC buys one-third share in OCR maker Scandata

A LOW-COST OCR page reader and a high speed OCR document roader both built in the US by CDC, are now being sold in Europe by OCR specialist, OCR Scandata. This follows a deal signed between its US parent, Scandate Corp. and CDC, under which the latter has acquired long-term notes and preferred stock that would give CDC a one-third share in Scandata if converted to common stock.

The low-cost page reader is called TOCR, OCRB numeric and E13B numeric. Terminal OCR, and can cost as little as £20,000. TOCR can read OCRB fount and

Council system finds model

plane winners in minutes

COMPUTER staff from Mer-

seyside County Council came to the rescue of competitors in the Federation Aeronautique in-ternationale Model Flying World Chemplonships held at fiAF; Woodwale, Southport, last week when they used the council's ICL 1804S system to cut down the analysis time of

scores and positions from the

usual weeks to a matter of

Installing an ICL 7502 ter-

minal system and four VDUs in a

caravan at the air base, Mer-

seyside computer staff took acore cards marked up by judges and input the data via the VDUs into the ICL 1904S which is based in Liverpool, a Post Office line being used to send the data.

Then at about 15 minute in-tervals up-to-date positions and ecores for the five competitions

m the analysis time of

numeric hand-printed characters at a rate of up under the deal between the two firms. TOCR five full 8 ½ x 11 Inch pages per minute. It can be used as a terminal device to a mainframe or

as part of a mixed media data entry system.
The document reader is the CDC 929 which can read single line documents at a rate of 1,200 a minute. It can recognize any two of four different founts — OCRA, Farrington 7B,

Scandata says that CDC has transferred its inventory of 929s and TOCRs to Scandata

will definitely continue to be manufacture either by CDC or by Scandata, but the continuance of 929 manufacture will depend on how many 929s are sold by Scandata.

● The agreement between Scandata and another US-based OCR firm, Optical Business Machines of Melbourne, Florida, under which OCR Scandata sold OBM's Laser OCR-One system in Europe, has been terminated. OBM has set up its own European subsidiary Transworld Optical Business Machines Ltd.

was looking for a South African

software house to buy, Hall said

that the company was always

looking for ways to strengthen

its software operations, but

there was nothing particular

about South Africa in this res-

The same was true, he said,

about refurbishing plants in

South Africa. There was no par-

ticular intent to expand these at

the moment. "We have plans to

expand in all our territory," he

ICL has had considerable sales

success in South Africa since the

US companies pulled out be-

cause of their government's

boycott. The latest sale, to the

eduction in the level of support

Rent rise upheld

(CW, August 10).

(CW, June 22).

lice, was revealed last week

pect at the moment.



imposed on the sale of computer equipment to South Africa, the government there is looking at he possibility of stepping up home production, and may even go into mainframes and CPUs. But this is still very much at the discussion stage. A meeting was held last week

under the auspices of the SA Computer Society entitled "The Domestication of the South African Computer Industry". Several companies at the moment are making components and terminals, some of which are even being exported to Europe, but a full-scale manufacturer is still only a talking-point.

The government-backed Council for Scientific and Industrial Research is interested in the manufacture of certain units of computer systems, but feels that most work would have to be done by private companies, possibly with government backing. Meanwhile, reports that ICL is

and made.

On the picture, David Holt (foreground), Merseyalde's chief programmer, checks some of the scores, while behind him is Mike Shaw, deputy director of Merseyalde's joint computer unit, and Phil Langman and Bernadette Coyne, both Merseyalde council programmers. planning to set up a factory in South Africa have been denied by the company. Peter Hall, director of corporate communications, said, "We are not thinking of setting up a manufacturing capability

## Cray introduces own front end

A FRONT end processor for the machine. The director of the Cray-I will be introduced next centre, Dr Wiln Nellson, told year by Cray Research. It is to be offered as a purpose-built, alternative to the IBM and CDC centre, Dr with resistin, told computer Weekly, "It is unfortunate that Cray Research did not introduce its front end pro-

– combat, serobatics, spead,

team race and radio control were produced.

Also, every evening, end-of-day results were printed out and despatched to Liverpool Uni-versity where the competitors

stayed, and following a draw to decide the next day's flying order, a print-out of this was

as front ends at the moment, One existing Cray-1 user, the European Centre for Medium Cray says that its front end range Weather Forecasts at Shinfield Park, Reading, has a CDC Cyber 175 front ending its CDC machines used at present.

mainframes that need to be used cessor a year or two ago, but we are now committed to the Cyber

## BCS competition for students

A SECOND computing competition for students is to be held Entries may consist of a deby South Yorkshire branch of scription or analysis of a parti-the BGS during the hext oular aspect of computing of a section of the competition each tem designed for a specific purpose. The schools, coleges, polytechnics, and unlversities in the South Yorks, students in the arts, commerce, area, and prizes will be awarded engineering and science, as well for different age groups and ascomputer science.

rage a wide range of entries from



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## Honeywell offers low cost version of Level 62

A LOW-COST packaged version of the Honeywell Level 62 small business system has been intro-duced which lowers the minimum price of a Level 62 configuration to £46.350.

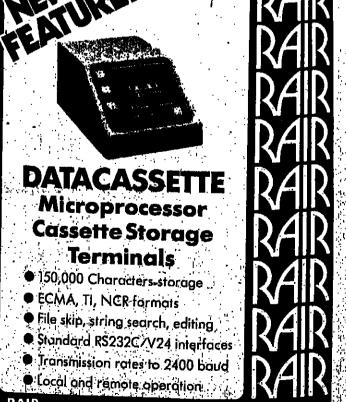
he new model; called the 62/ 10, is aimed at first time users, who are now offered an extended on-site growth path right up through Level 62 without having to alter their software as they grow.
The minimum configuration

includes a 128K-byte processor with console, two 40 Megabyle disc drives, a 300 ipm printer and all communications controllers and ports. For those who want to attach terminals from the start, a 62/10 Distributed Systems Environment configuration with the same processor, discs and printer, and three costs £50,400. For a 192K-byte transactions processing system with the same complement of peripherals, the price is about

Level 62, which has had several successful years competing directly with IBM's Sysline in a predom THE Price Commission has batch environment, is fast upheld IBM's increase in the evolving into a product oriented annual rental payable by UK users of its CICS teleprocessing towards online transaction pro-

monitor. The case was taken to There are now five models it the commission by the CICS Level 62, the 10, 20, 40, 50 and 60, Guide User Group, which comand users can field-upgrade plained that the price rise, from right through the line. £5,000 to £6,000, coincided with a

 UK Level 61 users want safy upgrade — see poge 9



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Number 615

Thursday, August 24, 1978

A wager was struck in August 1968 that MacHack's author, Richard Greenblatt.

chess program within 10 years. Although the computer chess enthusiasts that Slate and deadline is August 31, Levy has agreed to an Atkins have been unable to get the latest

extension to September 5 so that the final agames can be played at the Canadian Natio-time for the grand finale. It had originally

This match will be against the Chess 4.7 program, an upgrade of the world computer chess champion. Chess 4.6, developed by

David Slate and Larry Atkins of Northwes- finance and Chess 5.0 has not yet been

tern University, Chicago. It will be run on a CDC Cyber 176 at CDC's manufacturing centre in Minneapolis.

developed to full match fitness.

Computer Weekly's regular Chesslab editor, Professor Donald Michie of the muchine

Toronto climax to 10-year chess challenge

worth £1,250, between international chess master David Levy and four computer of Technology, against the Maclack pro-

scientists, is to reach its climax in Toronto in a match of six games, starting on Saturday, called Cheops, which was developed at MIT will have been generated by the wager. So

by John Moussouris, under the direction of

There is great disappointment among computer chess enthusiasts that Slate and

been planned that Levy would play Chess 4.7

#### NEWBURY

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even an adverse outcome would not leave

Professor Michie's Chesslabs, over the

past year, have provided Computer Weekly

readers with an insight into some of the

intellectual and systems issues involved in

the study of computer chess and Levy has

said that the advances in computer chess

over the past 10 years have been great and

that the result of the wager has been in the

Levy would like us to point out that the

figure quoted by Professor Donald Michie (CW, August 3) as his performance fee in

balance for some time.

## Briefing

#### 64 beats IBM into Citibank

AGAINST fierce competition from IBM with the Series 1 General aniomation has won a major contract from Citibank of New York to supply hardware for a US-wide banking network.

The system involves 11 cen-les, each of which is to be equipped with dual GA 167-160 computers. The contract worth \$5.5 million over two yars, also involves hundreds of GA 16/220 two-board micro-computers, IBM bid complexes of five Series 1s at each centre with no local intelligence.

#### Union talks at ICL

FURTHER talks are to tak place between ICL and staff mions on the possible format of the self-financing productivity scheme for 1978/79. Following a exeding last week at which the tompany set out its proposals (CW, August 17), unother meeting has been arranged for September 22 in Birmington ber 22 in Birminghum.

#### Micro impact

UNION officer Tim Webb of ASTAIS has called on the Miniom Sevices Commission and the Engineering Industry Insults Board to set up a joint study on the effect of microprocessors on employment, with particular reference to the prodems of retraining.

#### Slandard warning

If the US government adopts the US National Bureau of Standards proposal that IBM's 380370 JO interface should become a standard (Cty. July 27).

locywell will withdraw from
biding lot new US faderal syslins business. Honeywell's the president Steve Jerritts, thinks it a meeting of the NBS institute for Computer Science

more venture is now likely to bestled out of court following.

Letancellation of this week's alles court hearing by a Texus lass four more former Mostek cappier have joined Inmos addition of the conwhed that technical informa-to would be divulged (CW, Agust 17). Inmos director lann the would be expected the the would be settled soon.

#### EO's Pasoal

Applications of the computers of water including a standin compiler and associated in in the compiler and associated will be available in

Hiving their request for the former of the operators primingers at Brighton plant posts for the South the that now come under the general heading of Personal Computing Pages 13/15 THE MESSAGE Charl is convinced that TV, books, thereos, and an only must try to make the bound should should be young people

### **Electronic mail**

Levy would not lose a match to a computer

# draws nearer

DAVID LEVY . . . agreed to an

ELECTRONIC mail, another aspect of the automated office, is also drawing closer with the imminent emergence from IBM and Xerox of sophisticated facalable and message switching systems. Industry sources in the US believe that Xerax is developing an advanced communica-tions network, and point to evidence that IBM is about to produce a facsimile device. Howard Anderson, of the Massachusetts

consultancy The Yankee Group, cinims that IBM line placed an order for 30,000 4800-bps ems from Paradyne, and that these are to be

used in a facsimile-type device.

Anderson also believes that Xerox will announce within the next few months a store-and forward facsimile service,

#### ADVANCE TOWARDS THE AUTOMATED OFFICE

# Three in battle for intelligent copier

THE all-electronic office will soon be much closer to reality, as a word processing product, currently under test by three separate manufacturers, comes on to the market. This is the "intelligent copier", a device which combines the functions of copier and xerographic printer, and which promises to form the basis of integrated office systems

machine will probably reach the market first. This will start field

trials in a few weeks. Estimates

of its eventual sale price range

The Xerox machine, called the

Advanced Multi-Function

Workstation, is still very much

an experimental model, but is being field-tested by, among

from \$15,000 to \$30,000.

of the future. (writes Rory Johnston). The three companies known others, President Carter's staff to be well along the road on in the Executive Office Building intelligent copiers are Wang, Xerox and Toshiba. The Wang in Washington. Two units have

#### recommendation for robotics The micro applications panel,

Roberts, is due to provide its full

FIVE years after it published a headed by Plessey Microsystems report throwing cold water on managing director Derek research into robotics, the Science Research Council is likely to initiate a £10 million research programme into the

The SRC panel investigating new areas of application and technological developments for microelectronics has decided to single out robotics for special attention, and is recommending that a separate panel be set up to control the placement of

report to the Engineering Board of the SRC in October.

The Roberts panel is also currently studying image proces-sing and automatic inspection, a possible large multi-computer complex based on a variety of microprocessors, and a 32-bit

'midicomputer" in chip form. Initially, the total funding for research into all these was a suggested £5 million. The new Turn to page 2

May 24, 1973). Over the past five years, howeyer, the Japanese, Americans

alone doubles this figure.

In 1973, Sir James Lighthill

produced a report for the SRC

which suggested that progress in robotics and artificial intel-

ligence had been disappointing and he saw little reason why the

situation should improve (CW,

## The trade secrets squabble betsets Mostek and the NEB's. Call for national publicity campaign and venture is now likely to

should set up a system of the service industries, according to a report by the National Electronics Council in addition, the report says, a national publicity report says, a national publicity Commenting on this, Eric The "Think Tank" should set up a system of lating and analysing statistics The "Think Tank" should on the social implications of take this study under its wing, the said.

The "Think Tank" should take this study under its wing, the said.

The "Think Tank" should take this study under its wing, the said.

The "Think Tank" should set up a system of the service industries, according to a report by the National Electronics.

The "Think Tank" should take this study under its wing, the said.

The "Think Tank" should take this study under its wing, the said.

The "Think Tank" should take this study under its wing, the said. campaign is needed to impress on people the importance of computers in society.

COMPUTER WEEKLY'S INSIDE NEWS

One of the current buom eight on the

One of the current brom agas on ma always booming computer scene is the persunal computing market. In the US there has been phenomenal growth over the past bud years and in the UK and Europe the market is now begin-ring to catch five. This week's special section death with the "home brew" systems and plan the much wider fields that now conte under the general

PERSONAL MARKET

MORE inquiries are needed into the effect of computers on the should set up a system of columbia Central Policy Review Staff,

Commenting Howe, of the NCC, said he thought it would be useful, but One of the Council's specific was not timely at the moment recommendations is that the because of the government's

STAFF SHORTAGE

some practical solutions.

Compilerview on the mind expanders
Focus on the competitive life

Union wants curb on micros
Downstane by Chad

ALSO ....

One of the major problems facing computing services companies is the shortage of skilled staff. Alan Ben-

jamin enalyses the situation and offers

computer-conscious. Readers are saked to submit their ideas on how this can be done, with prizes to be won by the best.

Computer-conscious. Readers are Cl. to close US pentres Gilb's Mythodology Puzzlar.

Page 4

Programmer Notes Software File

Council also suggested that the British Computer Society should study the effect of current plans on amployment and education.

Op Spot Fibre optics experiment People in the news

People in the news
Diary dates
Ray the key to staff shortage
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JOBS: PAGES 20-38

## by the companies it keeps

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# When computers become the mind expanders

deluge of words recently that has attributed to this ubiquitous technology a variety of effects ranging from killing work to opening up the greatest industrial opportunities since the first Industrial Revolution.

In fact, the micro itself is only one component in a wider runge of information technology developments, such as the potential offered by new communications techniques (see page 9).

The unique attributes of the micro are cheapness and smallness. Larger, more expensive processors can perform the same functions us micros and, in terms of social impact, have as far reaching effects as the micro.

The qualities of low cost and low size, however, create the capability to spread computing and information processing techniques into vast new areas.

One of the most visible and understandable new areas is the personal computing market." To some, personal computers are all about Star Trek games and DIY computing enthusiasts; to others it means small business systems or educational aids. The survey of the UK personal computing market (pages 13-15)

the market however it is defined.

What is undentable is that for the first time computing power has become cheap enough for individuals to develop their own personal interests rather than to use computing power on behalf of some large organisation that can afford the computing

capability. The effect of this is already dramatically on display at any rsonal computing show in the US, where the phenomenon has been growing for a number of years. For example, at the personal computing fair at the National Computing Conference at Anaheim this year (CW, June 8), a contents addressable file system, similar to that developed by ICL, was on display. However, it was not the

work of a large company, but

the development of an ex-Yale University professor whose primary interest is in linguistics. University research provides an interesting study in the 'mind expanding" potential of micros. In the past, projects activity, because it gets right to requiring significant computing power had to have access to or any society — will develop ing costs of computing power logy age.

not only make it easier for those aiready interested in the use of computers to gain access to processing power but, perhaps more significantly, it brings computers into the orbit of those people whose primary interest is

some other area. The same situation is likely to happen in industry and other research establishments, with the result that there could be an

explosion of new inventions. The easy availability and friendliness" of the personal computer also offers a tremendous potential for extending the understanding of the technology and the development of the skills that will be the powerhouse of a country's evolving industrial base in the US, the personal com-

puting boom has already given that country an "ingenuity" boost, with a whole generation for whom the use of computers is as natural as pencil and ruler. Personal computers, as an educational aid, should therefore not be dismissed as a fringe university computers. The fall-during the information techno-

Computastars finals at the cover and provides access to Crystal Palace sports centre, refreshment and bar facilities. South London, on Saturday, September 30, finals are now rolling in and several teams are bringing strong parties of supporters. Where block bookings are received in advance, seats for team members will be allocated so that competitors can oin their friends while waiting or their events. Tickets cost 50p for adults and

To round off the day there i

to be a disco for all competitors and their partners. Tickets cost £2.50 per person including food, and as the demand is heav competitors are advised to boo

Computastars has been or ganised by Goldsmith Recruit ment International with the 20p for children and each en-support of Computer Weekly.

# TICKET



To: Computastars, Goldsmith Recruitment International Ltd. 15 Buckingham Palace Road, London SW1. Please supply:

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Ten years ago...

enjoying an abundance of awards and competitions. Anyone who manages to keep pace with every project deserves a prize on at least, a diploma. But there has been a notable

shift in prize-giving awards. A year or so ago, prizes involved trips to IFIP Toronto or Infotech Amsterdam which, it must be admitted, made a welcome break from trips to downtown Putney or Chiswick. Today's entrants have far more downto-earth incentives. Computer Weekly, for long the industry pace setter, leads in the practical

The adjacent Interrupt feature awards £5 for notable. amusing or intriguing happenings in the computer instal-lation. A spot of instant research reveals that many of the winning entries have the distinct advantage of an ability to reminisce at length about such veteran systems as Titan, Atlas and assorted 1401s.

# for all reasons

cash award, Computer Weekly is now featuring a weekly £5 Op Spot prize for the best hint. Many DPMs would be surprised if there was a prolific response to this particular contest, operators not being noted for taking hints, unless specified in writing and signed and sealed.

## INTERRUPT

BACK in the pioneering days of pictures on the display. computing everyone wanted to see what a computer looked like, directors what I called GAT, bles, won £250 plus a silver and as we had the first tran. Gunslinger Aptitude Test. A punch bowleand cups for see what a computer looked like, and as we had the first transistorised-machine in Europe, we had to put on a show for burdirectors! Standard hardware features then were loustpeakers and cathods tubes, both of which could be intsapplied for enter tainment, jurposes, we could produce Christmas carols on the loudspeaker and moving

OLIDAY IN

FOR TWOII

Outburwe card offer immediate purpose and coults of seconds, we watched to bur we card offer immediate purpose and pressed the button before Now, and up, came the purpose and coults of seconds. We watched to be seed to

# Awarding prizes

Not content with one regular

#### It was significant, perhaps, that none of the winners were DPMs, being in the main computer consultants.

DPMs, however, do come into their own with the annual iDPM/Data Logic Management Award (CW, August 3). This, without doubt in my mind, is the industry's most prestigious award. It is given in recognition of outstanding management achievements and performance. It also serves to provide recognition of the vital role of DP

ons of the Roberts panel The only company now microprocessor.



ll we've heard most claims about excessive noise from the no to sell slience so how long will it be before baldness a se is linked with noise. worse is linked with noise.

The truth a that within the office environment excess noise is an irritant at best, and at worst causes needsches, worker fetique and inetitolency caused by poor concentration.

Many distins from alteings cover menufacturers might make your hair fail out. Again the truth is that covers have to be catalully made to fitt machines exactly, they must be tested to make sure they are effective, operators might use machines with altenders to ensure their are no problems and the price has to be right quite a programme?

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# Heavy demand for Computastars seats REQUESTS for tickets for the Computastars starts a numbered seat under Computastars finals at the cover and provider and cover and cover and provider and cover and cover and provider and cover and cover

ACALL for a law that would halt the introduction of microelectronics technology into any company, spless prior agreement had been reached with the appropriate trade unions, has been made by Tim Webb, splical officer of ASTMS. But Roy Grantham, general secretary of the Association of Professional, faculty, Clerical and Computer Staff, commenting on Webb's request, rejected the need for such a pove, saying that instead of improving the situation it would be "counter-productive."

#### Head of APEX, the union that that "the impact of the microrepresents 153,000 members, and of which about 12,000 are in the computer industry, Grantham said that the law would be too much of a constraint on many companies and, if implemented, might force some of them to "go to the wall." "Rather than protecting some jobs, all the jobs in that com-

pany would then be lost," he What trade unions must seek, Grantham added, was a traditional solution to the problem, not a local one. "We must change society's attitude. We must create a society where the

consequences of this technology can be absorbed." The proposal is one of eight that Webb feels should comprise a coordinated national campaign by the TUC to protect workers' job security. He

outlines these in the latest issue includ of the ASTMS Journal. conomic forecasting, which ASTMS represents 441,000 members in scientific, technical ng statistical infor nation. The workload comand managerial positions. The other proposals are that

there should be a 35-hour working week no later than the end of 1979; holiday entitlement be

increased to a minimum of five weeks and the age of retirement

lowered to 60; voluntary sab-

batical leave after seven years'

service; the Manpower Services

Commission and the En-

gineering industry Training

Board jointly to examine the

effects of adopting microelec-

tronics with emphasis on

retraining aspects; workers

made redundant to receive full

pay until suitable alternative

employment or retraining can be

found; and that pay controls

should be lifted to allow UK

electronic companies to recruit

Under the heading "Is Small Really Beautiful?" Webb writes

pies a mixture of termina kossand batch processing. A CSO spokesman said that to decide had been made yet on precisely what machine woodrepisce the Univac 1108, but confirmed that the order waddeplaced "In accordance with government progueoment

to ousi

Univac at

Treasury

lation looks like coming ICL's way soon from the Treasury.

way soul middle to replace its which is planning to replace its Unive 1106 multi-processor.
The 1106 is operated by the Central Statistical Office on be-

felf of the CSO and the Trea-tury, and was installed in 1973.

The Univer system was chose:

despite the government's single under procurement policy be-

cause ICL did not bid for the

contract, the main reason being

that it had no system at the time that could handle the applica

sons required. Applications

He Information was for hossing shout the software corresponds tesk that would be britted in moving from a Universe state of the CSO spokes was pointed out that most of the m the programs that run on the

Construction of a purpose. bitcomplex, to house the new stem in the courtypard of the Treasury building in Great George Street, Whitehall, will statusty year.

second industrial revolution . . . there is no doubt that the silicon chip or integrated circuit has already made a major impact on certain industries." He cites the Swiss watch industry, hit by the digital quartz watch boom, and electro-

processor has been likened to a

mechanical calculator manufacture, hit by the low-cost electronic pocket calculator, as two victims of the advancing incursion of microtechnology. Despite disagreement on the first point, Grantham and Webb agree on the inability of society

to handle the problems thrown up by this incursion. "It is my view that our present structure of society and industry does not have the proper social basis to deal adequately with the forthcoming changes." said

A PILOT Installation of 30 NCR 266 supermarket checkouts has been established at the Hyde, chester, superstore of the Fine Fare group, as the first phase in what could be a mojor point-of-sale system covering 25 superstores and over 700 other outlets.

The Main 255- and the first phase statement of the first phase in the first p

The Hyde 255s are due to go into operation in October and will be linked to an NCR 726 instore mini with a second 726 as back up. initially product data will be keyed

. ....

inser scanners, Fine Fore has placed Thomas Formen and Sons, of Not-tingham. These inbels will carry the Article Numbering Association's eight-unit bur code and Fine Fare claims to be the first UK company to use this for its own produ

• Here Forman's litho machine room manager Stan Messom (right), and machine manager Jack Crabtree, check the bar coding on labels for cans of peas.



INCREASING competition in the personal computer market. coupled with declining revenues in the purely hobbyist market for such equipment, has led to Pertec's Microsystems Division posting its third consecutive

Ryal Poppa, Pertee chairman, says the losses stemmed from a lack of penetration into the growing small business system market, and inadequate attention to the needs of the division's network of 70 dealers.

Speaking at the firm's annual meeting in Marina Del Rey. California, he said that following this current quarter's loss the division, which makes Mits Altair and iCom equipment, should break even by the end of the year, and enter profitability in the quarter after that.

• The division's parent company, Pertec Computer Corporation, is selling 1 million shares of common stock on the open market, the proceeds of which will be used, according to Poppa, "to retire bank debt."

# Viewdata and its potential impact in Europe A multiclient study

In April of this year we at Butler Cox launched a multiclient study on viewdata and its potential impact in the USA. The study necessitated the most detailed and comprehensive analysis of the UK experience with Prestel, of the development of comparable systems elsewhere and of the prospects for viewdata in America.

Our US study has achieved a remarkable degree of acceptance: over twenty of the largest relevant organisations in America are already

We are now about to launch a furtherstudy concerned with the potential impact of viewdata systems in Europe.

The advent of viewdata systems in Europe is clearly imminent and of the utmost importance In Britain the Prestel public service is about to be launched. France is developing its own home-grown system: The Netherlands and the German Federal Republic are. contracted to test the UK system.

The European study will provide a rapid and practical assessment supported by detailed investigation, of -the potential of viewdata systems in Europe. It is designed to be of interest

\* Publishers and providers of all kinds of information services. \* Television, media and electronic

\* Telephone and communication

\* Agency services — hotels, travel. leisure.

\* Computer and office equipment \* Government and regulatory bodies.

The report will be produced in English, French and German. The

results will be available ONLY to subscribers. For further information and a detailed prospectus

Viewdata Research Unit Butler Cox & Parlners Limited Morley House. 26-30 Holborn Viaduct Telex: 8813717-GARFLD Tel (01) 353:1138

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For those whose time and writing abilities are in the more extensive mode; there was the Computer Weekly/Dataskil essay competition. This year's entrants were asked to explore

hardly explored.

now information technology would affect life styles by the year 2000. The winning submissions were predictably gloomy. with one joint first prize winner, Bryn Jones (CW, June 8) parti-

This year's winning DPM, Roy We decided to show our Hesling Brown of Hornby Hob-directors what I called GAT, bies, won £250 plus a silver

all the winning essays was the lack of any mention of computer installations. Given the premise

was being investigated by a technical committee sponsored by IDH, a subsidiery of IPC... cularly doleful about life in 20 in fact, the common feature of that life will be very much computer-controlled, the question of whose finger will be on the terminal keyboard was

Top executives at ICL were to have video terminals in their offices linked to a 1906 computer, to provide up-to-the minute details of company activities . . . In the search for Camelot, a KDF9 computer was being used to process the results of a geographical survey covering a 40-metre aquare in

**COMPUTER WEEKLY** 

AN information retrieval system

designed to meet the working needs of the legal profession

Intelligence and Perception at Edinburgh University, was to be marketed in the UK by Systems Consultants . . . A study committee for French Technics Terms proposed that Angle Saxon words herdwere she software be dropped in favour of motériel and périgramme. Some of the other suggestions were hardouére and softouers. quincalife and mentalile, rabi

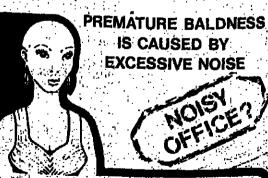
Somerset . . . The conversational language, POP-2, developed by the Department of Michael

**AUGUST 22, 1968** 

## £10m robotics research

great vigour and the recomsupport the views of Lighthill's critics that his report was incorrectly pessimistic on the subject.

making robot systems in the UK is Hall Automation of Watford, which has made about 100 sys-tems; 80 of these have gone for export. It is shortly to announce a new robot based on a Texas Instrument TMS 9900, 16-bit



LAWS to give the public a right of access to all government bonds could be self-defeating to release," he said. ad have the opposite effect to that intended according to Lord Coham, former head of the land Service.

Public access laws

speaking on BBC radio about imposals for a Freedom of Inindication Act. Lord Croham and that in the US, where such in Act has already been implested, there were the beginder of includes of a predictable tendency willing as little as possible to did the danger of embarassing

wis the information that the was meant to provide was stallable at all even to further not to release are instantial would Material would soon en-

LERS

PRESENT CO. LTD.

sure that there was no analysis

Croham said, was that government departments did not keep unified catalogues of all their records, and to set up a central catalogue would be very exside looking for a certain document was only assuming that it existed, and it might be very hard to find under the descrip-

gree of secrecy traditionally maintained in Whitehall was damaging rather than helpful to good government, as was initiated when he was in office in 1977 in a government decision to release more background information on decisions.

self-defeating' -WARNS EX-CIVIL SERVICE CHIEF

A further difficulty, Lord

tion given: While agreeing that the de-

### Yolune order

THE first volume order for the Digital Equipment PDT II intelligent terminal has been plated by Midlectron of Belper. Derbystere, which is to take 50 of the terminals. The POT 11 Incorporates DEC's 151-11 mecencomputer and is built around DEC VIIII stop terTERMINALS



#### Model 7008-7009

- British design and manufac-
- Based on BOBOA Micro-
- Two-page Momory 3,840 Characters
- 24 Displayed Lines of 80
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- Hard Copy Printer Output Protected Field Format-
- Blink-Background or Half XY Cursor Address (send
- and receive) Roll or Page Mode
- Video Output for External Full Character Editing Fea

Green Phosphor Non-glare

- Take aspirin (two), Block Transmission from Screen by Line or Page

#### Models 7001-7002 24 Lines of 80 Character

- per line Selectable Baud Rates from 50 to 19,200 Baud Dual Interface—CCITT V24
- and 20/80 mA Current Teletype Compatible
  Hard Copy Printer Output
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- 60 to 19, 200 Baudi CCITT V24 Interface Selectable Half or Ful Dublex '
- Green Phosphor Non-glare arni ways PRICES FROM £495

  - Folies Bergeres voice recognition: ch? film strip-blue movie global searchi HM Customs

It's nice to see somebody ben-

how about the trees used to

make all that paper? I would

have thought that the Whale

Protection Fund would start to

get protests from the Save-A-

Tree people. Messages written

on whalebone, perhaps.

likely to make mistakes.

## Timber-thar she blows...

IT isn't just greedy capitalists who use computers to mass-produce junk mail. The Intern-mainly in the US, protesting at ational Whaling Commission in Histon, neur Cambridge, is being flooded with thousands of iden-

#### Coursesfoiled again

nights close in And leaves from trees

(deciduous) do fall, When summer's outdoor exercises (strenuous)

Eventually, and squeichingly, appul: When harsh reality, like statements from the bank.

Chills one's hopes, however Then is the time, the polys say,

To take that further course in And PL/1, or RPG.

Or structured programming (all three?) —

But wait: unlike the ploughman, now That weary homewards way I'll tread:

retire from view And nurse my stinking code instead.

# Inmos comes

DOUBTLESS you were dis-tressed to read that our gallant lads at Inmos, nobly leading Britain forward into the 20th Century, have been taken to court by those horrid Mostek people. But do not despair — it is simply an initiation rite into the arcane mysteries of the semiconductor business. It means Inmos has been accepted into the fold.

Prolog was originally developed at the University of Marseilles as a tool for research into computer systems to understand natural language (such as English or French), but The US companies in the field spend half their time and ener-gies suing each other over it has since been put to practical use in a number of areas outside pure research. Examples include a package for doing algebraic "symbol crünching," an architectural design aid to assist in planning the layout of a building, a system to help predict the properties of organic compounds (needed in designing drugs), and the implementation of a compiler. All of patents and so forth — it's part of the game. One pundit gave his advice to American mothers: "If you want your son to get into designing drugs), and the implementation of a compiler. All of designing drugs), and the implementation of a compiler. All of these are large and complex programs which would probably never have got written at all with the available manpower, were it not for the relative ease of writing them in Prolog, The name stands for "programming in logic," as Prolog is actually based on a simple form of symbolic logic. However, the language is remarkably simple, and quite easy to understand without any specialist knowledge of either logic or computers. semiconductors, send him to law school."

#### Text fax

WORD processing has more than its share of baffling jargon and buzzwords. To help you out, the WP people at Logica in their idle moments: (Wow! They actually have some) have produced a glossary entitled All the fax you don't need to know about text processing and wouldn't dream of Ascling." Here are a few samples from it:

floppy disc: backache twin floppies: hernia inter-job transfor: sacking sideways scroll: Chinese

multiplexing: confusing several ways flash suppressor: rain coat fact-simile: lie intelligent fact-simile: big, be-lievable lie

ook-up table; front row at the

interpreted as statements of fact. For instance, the first clause says that, whatever may be the values of the variables X and Y, "Y is a descendant of X if Y is one of the offspring of X ". Similarly, the last clause says that "Jacob is one of the offspring of Last." Note that variables in different clauses are considered distinct, even if they have the same name.

The second way to understand clauses is as pieces of program, Each clause corresponds to a case" of a procedure. Looked at in this way, the first clause can be read as. "To find a that is a descendant of X, find a Y that is one of the offspring of X," and the last clause as, "When seeking an offspring of Issacrietum the solution Jacob."

The six clauses of the example serve to define two procedures, named "descendant" and "offspring." Each clause consists of a head, or "procedure antity point," followed by a (possibly empty) flody. The body consists of a number of goals, or "procedure as a Prolog program actually work? To run the program one provides an initial goal such as:

descendant (abraham X) ebugger: systems analyst (from Ancient Pidgiri English: "so dat's de b.....")

## DP technology without tears

Kremmen" cartoon strip in London's Evening Standard, the planet currently occupying the hero's concerns is called

Is this part of a cunning underhand plot to make us more aware of computers and the information technology On Which Our Future Society Will Depend? I shall follow the strip carefully, looking out for

subtly-slipped-in computerisms. Memories are coming back to the threat to whales and demanding that catch quotas be me from my mis-spent youth, of an idea Mad magazine had The US Whale Protection during the Sputnik scare. They Fund alone has produced 74,000 thought the media should try to letters, and they are still pouring make American youth more in, despite the fact that the science-conscious. Among their meeting for fixing the quotas suggestions: The Lone Ranger was two months ago. The IWC describing the chemical reacdoesn't bother to open the let- tions in his cartridges after ters any more, but just gives having shot the baddy; a them to local stamp collectors. Peanuts cartoon of Lucy explaining the ballistics of sending Charlie Brown POW! and best of Whales are all very well, but all, a strip show cum chemistry

> I'm a cat — cat — catalyst, a name that may sound strange, But a catalytic agent can cause a chemical change.

GUEST PRIVATEVIEW

What is Prolog?

In this Guest Privateview, DAVID WARREN, Research Fellow in the University of

Edinburgh Department of Artificial Intelligence explains why programming in Prolog takes much less effort and reduces the probability of error; compared with

PROLOG is a general purpose programming language, of an unusual kind. It doesn't have a goto, More surprisingly, it doesn't have an if or a while either. It also does without that

essential ingredient of conventional programming languages
— assignment. Nevertheless, Prolog is a perfectly practicable

language for writing "real" programs, and many tasks can be programmed as efficiently in Prolog as in other, more familiar, high-level languages — assuming that the Prolog program is suitably compiled, for example by the compiler we have produced at Edinburgh for DECsystem-10.

People choose to program in Prolog (with on the language)

People choose to program in Prolog (rather than other high-level languages) mainly because they find that the

programming takes much less effort, and that they are less

A Prolog program consists of a sequence of statements

called clauses. Here is a simple example, consisting of six

descendant (X, Z):-offspring (X, Y): descendant (Y, Z):
descendant (X, Z):-offspring (X, Y): descendant (Y, Z):
offspring (abraham; ishmael): offspring (abraham; isaac):
offspring (isaac, esau): offspring (isaac, jacob):
Clauses can be understood in two ways. Firstly, they can be interpreted as statements of fact. For instance, the first clause says that, whatever may be the values of the translation.

That what she says is true.

Singer: So light your Bunsen Burners, boys, and let me act on you!

You get the idea? The possibilities for this sort of thing in the computer field must be enormous - and, you will agree, vitally important for our future if Britain is to take its rightful place in the vanguard of our technological Wonderful World, Any ideas from you, dear



readers? Send them in, and I will say nothing of the instant fame, print the best ones. There will be scriptwriting contracts with

### Pendulum pitfall

£5 prizes for each one printed, to ITV, etc.

our trail-blazing pioneer in the groves of academe had notched up another first — the discovery that the Earth revolves, a new turn of the wheel of technological revolution. Or at least that was the implication of a Guardian caption to a photograph of Canon John Collins and Professor Michael Pentz watching "as a 268ft pendulum is suspended from the dome of St Paul's Cathedral — part of an Open University experiment on

Eppur si muove, as Galileo said, and got an F for Fail in his TMA (tutor-marked assign-

● IT'S not often one reads som ● IT'S not often one reads something earth-shattering in a house magazine, but the latest issue of Digitales, from Digital Equipment UK, is very revealing. A readership survey asked, "Who else reads your copy?" and the snewers given were: 180 spice (see Downtine, July 13), 33 children, 45 relatives, 36 friends, and one dog. Makes you sit up and take notice (or beg).

I NOTICED the other day that the Earth's rotation..."

The result of executing this goal will be to enumerate descen-

dants of Abraham and return them, one by one, as values of

To execute such a goal, the Prolog system matches it against the head of some clause and then executes the goals (if any) in the body of that clause, in left-to-right order. In seeking a

match, Prolog tries the clauses of the procedure concerned in

the order they appear in the program. The matching process, known technically as unification, succeeds if the goal and clause head can be made identical by "filling in" suitable values for the variables. For example the goal 'offspring', ishmae!)' matches the first clause for 'offspring' if X is given the content of the procedure of the content of t

the value 'abraham'. When one solution to a goal has been finished with, or when no match can be found for a goal, the Prolog system backtracks. That is, it goes back to the most

recently executed goal, and looks for an alternative match.

So what happens when the initial goal 'descendant (abra-ham, X)' is executed? Through matching the goal against the

first clause for 'descendant,' Prolog starts by looking for the immediate offspring of Abraham, and returns successively X='ishmael' and X='isaac.' Then backtracking causes the

second clause for 'descendant' to be used. This results in the

'descendant' procedure being called recursively for each of the offspring of Abraham, giving further descendants, Esau and

So far, the only data objects we have seen have been

unstructured constants corresponding to names of people.

Prolog also provides for structured data. An example is the

concatenate ((X.L1), L2, (X.L3)):- concatenate (L1, L2, L3).

ire X is the first element of the list and L is

lists manipulated by the following concatenation procedure:

A Prolog list is either the constant 'nil' or a structured object

variable standing for the remainder, or 'tail,' of the list.

concatenate ((1.2,3.nil), (4.5.nil), L) produces as value for L the list '(1.2,3.4.5.nil)'. However the concatenate procedure can be used much more flexibly than concatenate.

concatenate (L1,L2,(1.2.3.nil))
will return, as successive values for L1 and L2, all pairs of lists
which when concatenated give the list (1.2.3.nil).
As a final, more meaty, example, there follows a Prolog
version of Hoare's "quick-sort" algorithm. The interested
reader should be able to figure out how the program works
from what has been said already. As an example of how it is
used:

split(L;X,L1,L2), qsort(L1,(X,R2),R), qsort(L2,R1,R2).

Trolog — he language and its implementation compared with List." I Warren, Pereira and Pereira; in Proce ACM SIGART-SIGPLAN Symposium of Aland Programming Languages, Rochester, New York, Aug. 1971.

研究研究情報的問

split(nil, Y, nil, nil).
split(nil, Y, nil, nil).
split ((X,L), Y, (X,L1), L2); -X < Y, split (L, Y, L1, L2).
split ((X,L), Y, L1, (X, L2)): -X > Y, split (L, Y, L1, L2).

concatenate (nil, L, L)

Executing the procedure call:

concatenate (L1,L2,(1.2.3.nil))

qsort ((1.9.7.5.nil),nil,L) returns (1.5.7.9.nil) as the value of L

-qgort (:(X:L),R1,R):--

centres by end of 1978 much less than the suggested figure and pointed out that the

US operations.

TWO west something to use computers on extra staff because the Wang system enabled him to handle more work.

tomeround attention to clients' needs," he input to the system specifying, for example, price range. A list of suitable properties is then provided on the screen. As a bonus, it can also

ICL to close six US

loss included overhead costs

which are part of the establish-

As part of the Americas reor-

ganisation, ICL is also closing its

Americas headquarters in

Atlanta, Georgia, in addition to

the five sales offices. The new

headquarters will be in East

Brunswick, New Jersey, which

An indication of ICL's inten-

ested in the report on acquisi-

operations if they believed in

ICL's intention to attack the

ment of new operations.

Bird learnt about the system from his friend

Computer Services of Fulham, Lon-

Ford, who has been systems

and technical support manager

for ICL's international division,

is appointed to the new post of

general manager for Latin

be responsible for activities in

Mexico and South America.

The systems run in the offices of Bird and

Andy Dickson, who was the first to install the

Wang, which use software developed by

Dickson can be linked, to extend the housing available to the companies' clients.

The desk top Wang machine is used to interrogate a database of available houses and

flats. The requirements of the home buyer are

down five of its 11 offices by the end of the year, and is to comblue all its north and south American operations under a single vice-president. This follows a year in which CLoperations in the US ran at a

is US operations, ICL is to close

The companies are Clindwick Bird, or Chis-wick High Street, and A. A. Dickson, of New Wide Road, Fulham, who are both using a Wang 2200 system to assist clients in buying

ad selling homes. Bill Bird, of Chadwick Bird, said that the

computer system could do the work of two seeple home tenth of the time. "The computer

Me business because we have been freed from some routine chores, allowing us more time to

give personal attention to clients' needs," he

helped in enhancing the human side of

loss, and the rejection earlier this year of a report on US com-panies, which could be acquired by ICL as part of its expansion in

The report was carried out by ICL staff in the US, but when it was presented to the ICL Operations Review Committee m London, it is understood that the recommendations were Rejected on the grounds that Europe will be given priority overthe US as ICL's key area for

ICL refused to comment on hedelberations of its Operations Review Committee. A ompany spokesman said however, that ICL was making significant investment in its marketing operations in the US wacturing plant at Wice in New York State.

ommenting on a suggestion from an industry source that iChadlost £1 million in the US bat year on a £4 million turn wer, the spokesman admitted that there was a loss on its US operations but said that this was

Americas market with renewed Bright, formerly viceprosident of ICL's Pacific operations, becomes the Americas

vice-president. Emphasising the importance of strengthening the sales operation in the US, Bright will

### British Relay forms <sup>3 yie</sup>wdata division

RESTEL information provider these figures to fall to £3 or £4 on minufacture and supply viewdia systems to business and

mestic customers.
The first units are expected to e available at the end of Sepaber, using ITT and STC sets. testing at prices fixed by the lost office at £14 to £18 a

dish Relay has formed a new top of normal TV rental as prowindata division to design. duction increases over two or three years.

Future plans include coin operated models for public siting, and provision of closed user group services for businesses. The company is organising a

## Thoseon wins Kuwait order

which is worth about £10 which is worth about £10 lion. pson of Sweden by Kuwait's linking of Communication. manges previously installed sided under the contract.

Ericsson has also received an order from the Malawi govern ment for crossbar and other telephone equipment worth about £24 million.

#### GOVERNMENT COMPUTING

EXCHEQUER AND AUDIT DEPARTMENT, LONDON findings for ecoses to a number of different manufacturers equipment in the sec required for installation before March 1979. The equipment is required for installation before March 1979. The equipment

> na CEN/YO sho Joze sent to Central Computer Agrecy Room 822

Estate agents bring computers to the high street

The service is greatly appreciated by house sellers as well as purchasers. Bird said that c

flat was recently entered into the computer

database at 9.30 one morning. Within half on hour, eight appointments had been made and it was sold the next day.

Bird sold that he would have preferred to buy a British system, but he did not see anything that could match it on price/

One of Bird's clients commented after using

the service, "I have sometimes felt that com-puters were the unacceptable face of automa-

tion but this system has shown that the com-

puter has a role in the high street for the visible benefit of ordinary people."

previous senior men in the US.

sident of the US marketing

Americas vice-president Spud

division, are returning to take up

ments" in the US have come to

America and OEM sales and will now that their "tour assign-

senior appointments in the UK

## COMPUTER WEEKLY, August 24, 1978. NCC calls for details of breaches of computer security

THE National Computing Centre would like to hear about any examples of breaches of computer security, to help with a study of security the Centre is carrying out.

As part of its educational and advisory services on security. the Centre wants to compile as thorough a file as possible of examples of security breakdowns, and then carry out an The sort of incidents the NCC

would like to hear about are: fire, equipment breakdown, operator error, malicious damage, tampering with files or programs, strikes, unauthorised disclosures of confidential data. and the like. Names of individuals and organisations will be kept secret if desired. Taylor and Geoff Rowett, pre-

Those who have any information along these lines, are asked to contact John Pritchard at the NCC, Oxford Road, Manchester MI 7ED, telephone 061-228 6333.

This analysis of cases where computer-based systems have suffered loss of availability or

out by the NCC assisted by Adrian Norman, a consultant with Arthur D. Little. The results will be published as a supplement to the Centre's Management Handbook of Computer Security, which provides advice to DP managers on the nature of security problems and the techniques available to deal with

This looseleaf book has chapters covering the security aspects of physical environ ment, personnel, systems design, insurance, contingency planning, and auditing of security. It costs £80, or £60 from the NCC's book club.

#### More workspace

TO provide more space for Argus production, assembly, testing and software, and sales staff, Ferranti is taking over extra laboratory and office accommodation near its present plant at Simonsway, Wythenshawe, Manchester.

## has been the headquarters of its tion to continue playing a at a lower level than that suggtions, is given by the appointments of the men who will take over the ICL Americas operations, Dick Bright and Bill Both are US nationals and one source who knows them well commented that they would take responsibility only for these series of conferences to promote Hotel Schedule

The Plessey Peripheral System PM-DSYST-1 is a family of enhanced DEC 320-compatible general purpose, time shared, disc based computer systems specially designed for business applications. It uses Plessey commercial systems -001 disc resident operating system and can run all languages applicable to RT.11

The basic PM-DSYST-1 package includes central processor with 64 K bytes of MOS memory in an attractive chassis • a 5 or 10 Megabyte dival disc system with one fixed and one removable cartridge • a video terminal or an impact printer terminal • the PCS-001 software package.

Equipment for system expansion includes additional cartridge disc storage up to 20 Megabytes • dual floppy disc units with 512 K bytes • 45 cps Daisy Wheel printer of a 300 LPM printer • various additional video terminals or hard copy terminals.

See it working for you.

To allow you first hand experience of this remarkable development, Plessey have arranged a series of "hands-on" demonstrations around the country.

Come along to the hotel which suffs you and ask your questions. discuss your applications with the technical people, and see for yourself the simplicity of this advanced computer and its

If you know in advance that you will be coming try to let us it you know in advance that you will be coming try to let us know. Telephone Mrs George or Mrs Wilson. Otherwise just come know, we shall be very pleased to see you.

Wednesday 20th Soptember Thursday 21st September Monday 25th September Tuesday 26th September Wednesday 27th Sentembe Thursday 28th September Friday 29th September

Thursday 14th September Friday 16th September

Birmingham

Grand Hotel Post House Hotel Ship Post House Hotel Great Western Hotel Post House Hotel





Other Sales & Service Centres: Manchester - Duncan Hilton 061-440 8485. Please sand me full technical literature on your new PM-DSYST-1

To the state of th Address.

#### **EDITED BY PETER HEWITT**

## GILB'S MYTHODOLOGY Mecca method for comparing systems . . .

ONE of the management methods which consistently scores high among my course participants is the Mecca method. Mecca stands for Multi-Element Component Comparison and Analysis. Mecca is a technique for helping compare any two or more competitive alternatives. Mecca is not needed if the only comparison criteria is simple. say the price as an example. But it will be appreciated if the choice is complicated, and based on many variable qualities which must be considered at the same time. This situation common in the comouter business.

Thus Mecca was originally heavily used to help compare computer selection choices, and is now frequently used to help evaluate such questions as the best software package. the best operating system or

the best database software. The idea is not new. I have a letter 200 years old from Benamin Franklin to Joseph Priestly which advised him to use a variant of the method to solve his decision-making problem. Ten years ago, I presented the method to the National Computing Centre, vho years later reported to me that they had spread it widely n the UK for computer selecion purposes. The usefulless of Mecca is first perceived by those who have had to truggle with the problem of

have stimulated at least one

reader to experiment suc-

cessfully with Basic for produc-

PROGRAMMER NOTES

ware and software systems. I should mention that it has other uses, and has been used to evaluate job candidates, organisational decentralisation. and atomic energy plant selec-

In a very brief space, I shall sketch the method. Step I: A list of the major quality criteria is made. If necessary a bierarchical (root like) breakdown can be made for detail.

Step 2: Percentage (of 100% of any group of quality criteria) weights are assigned to each quality area. These to explain why we have over should ideally be in proportion evaluated their competitors to the long term economic and under-evaluated their own impact of variation in the offerings. This phase is often quality being weighted. In any the most interesting and case, the evaluation group and Luseful. At some point you stop higher management should due to schedule pressures of agree on the weightings.

Step 3: Facts are collected about all the qualities being evaluated. When most relevant data seems to be in hand, a relative score is given for each alternative design being evaluated, at the most ntary (detailed) level of the Mecca model.

The scoring system gives five points for "average" quality (within that group being evaluated) and down to zero in steps of one, or up to 10 (meaning as good as is interes-

Step 4: The weighted average score is computed up through the model hierarchy.

has written to argue against the

experiments

THE debate over the proper sphere of application for Basic remains lively.

Suggestions that the language could legitimately be applied to a wider range of applications (Programmer Notes, March 16)

(Programmer Notes, March 16)

EXPERIMENTS

Meanwhile, a lecturer from use of the language in teaching.



Step 5: Is to re-cycle, es-pecially to Steps 3 and 4 above and try to provoke better faccollection, or even alteration of the facts (like a price discoun by the second place alternguarantee. All critical things are evaluated and contrac guarantees are often among

We also try to provoke losers the fact that you sense that no

further progress will be made. This short description must necessarily leave out some of the rules and cautions for making the method work well. Though you can discover these for yourself by applying common sense and getting some personal experience with the

You might like to try it the next time you do a comparative evaluation. If nothing pops up in your professiona work immediately, you might like the exercise of applying the method of evaluating cars, a marriage partner or your

SOFTWARE FILE-1

CA moves on SNA emulator pack

the 24 terminals attachable to a

The SDLC Processor, priced at

series produced by Teradyne,

which is a major manufacturer

of circuit board testing systems.

Systems Network Architecture microprocessor as a front-end in has been made by Computer conjunction with a software Automation, which says that it will later this year provide SyFA tion package based on SDLC

The company has also announced screen management software for its SyFA systems and a new disc-based operating system for the Naked Mini 4 family of OEM minicomputers.

£4.500, and the SNA-3790 software, also priced at £4.500. further expand the range of SyFA communications facilities, The new SDLC facility, which already includes emula-allows one or more SyFA sys-tors for 2780 and 3780 RJE and which already includes emulatems to communicate with a 370 an interactive 3270 emulator.

SvFA svstem.

#### Further development of IC testing system behind takeover

THE further development of a programs for any of the L100 software system for testing integrated circuit boards is cited by Teradyne Inc, of Boston, as the chief reason for its takeover of a software house based in Dallas, Texas.

The company, Digitest Corp, is the developer and owner of a program known as D-Lasar. which Teradyne makes available to its customers as P400 on University Computing Company's time sharing network.

By acquiring the assets of Digitest Corp, Teradyne will gain technical control over the future development of the software, said a spokesman.

P400 is said to be the only commercially available software that can automatically generate complete input test patterns to provide high fault coverage on complex IC circuit boards. It may be used to generate test

language to help you.
"One thing to remember structured as well as the pro

"When it comes to the actual

Allowing for possible mist regulation from the Italian, Ms Brambi says that, "Using Basic, I vas able to set up security files them into Basic.
"The chief reason Basic is mediated by a cryptorithm (dryptographic algorithm?) and popular is that it is cheap to a variable password. implement and cheap in the "Without going into detail, these enabled me to control access and multi-user updating sense of paucity of its concepts

of my database from all parts of Europe, Asia, and America."
A. J. T. Davie, a lecturer in the Science of St Andrews, addresses the disquiet felt by many at the use of Basic for initial

Anna Brambi, from Tremezzo

In Italy, writes (in Italian) that

"stimulated by the article, I

quickly implemented a variety of facilities that had occurred to me, using Basic in batch mode

on a large remote computer".

instruction in programming.

"Experience as a teacher has shown me that once a programner has learnt a structured language like Pascal or Algol, he very easily learns other langu-ages, structured or unstruc-

"However, if he has been

"However, If he has been brought up on some unstructured language — and my expending is with Fortran users— he finds it very difficult to accept the iconcepts of higher level languages, ist along learn them.

"Although it is possible to do structured programming in Beaic, the language, makes it very difficult. In fact, structured programming is possible in most lenguages you care to name, but leds made much hore difficult if there are no facilities in the

about structured programming is that it relies on the data being gram. There is no facility in sasic for records and none for allowing structures to point at

program, this is difficult to structure also because the structured concepts ifs . . then . else, and while . . do are not in the language. So it involves writing down your ideas in another way first (possibly in a structured programming language) and then hand translating

It is also cheap to get a pro-grammer off the ground with it — because there is so little to learn, However, he will never

One attempt to introduce control structures to Basic is the Strubal .(Structured Basic Language) compiler produced for the Motorola 6800 micro-processor by Hemenway Associates of Boston, Mass. Programmer Notes would be interested to hear of UK experience with this software.

#### Puzzler

HERE is another of those very clever, "true" alphametics where not only is the message valid but the concealed addition sum also. See page 37 for the unique solution.

POURTEEN FUTTEEN THREE

new screen handling software allows the programmer to create terminal layouts interactively. emulator executing in the SyFA's main memory.
It will support SNA com-The system also enables the user to define data input edit rules, which will be applied automatimunications initiated by any of

cally by the software. In its first release a single user development system, OS4 offers Naked Mini users facilities based on a real-time executive and file manager which will now be common across the hardware

Program development facil. ities include source and line editors, a macro assembler and linker, and a debugging module. Currently supporting Fortran and Assembler, the system is expected to run Coral, Commercial Basic, Cobol and RTL/2 in

multi-user, he added.

the near future, according to a

spokesman. Subsequent releases

will also be fully re-entrant and

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ease send me a registration card.

Name

## Top Coral man for BCS talk

work on the formulation of a for word processing, and the two

ready late in 1980 and an also examining (CW, June 29).

committee's intention to veloped by the Stanford

Nowtheless the group had EDU and others.

Corel, Professor Michael Griffiths of Nancy University, France, will be the speaker at a meeting of the 8C8 specialist group concerned with formal aspects of computer science. The meeting is on Thurs-dry, August 31, at the Polytech-

Standards Institute has begun

slandard end-user language for

text processing. The committee,

under the auspices of the Com-puter and Business Equipment Manufacturers' Association.

aims to have a complete druft

approved standard by early

The team, which comes under

the jurisdiction of Ansi's X3J6

division, is also seeking to attain

recognition as an ISO working

group, according to the chairman, Charles Card of Uni-

The proposed standard will

encompass both the syntax and

the semantics of the language,

according to Card. Its scope will

adude the definition, descrip-

ion, recording, recall, transfor-

malon searching, manipulation

A major overlap was inevit-

she with word-processing and

computer graphics, noted Card. However it was not part of the

sandardise in these areas too.

THE international consortium

which has been studying the

design to digital electronics for the EEC is to present its results

At a conference in Brussels in

The consortium — led by

Saget and including Plessey, Mixtorf, and Sema with Brunel

<sup>olversi</sup>ty as consultants — be-

an work last July (CW, July 21,

(77) and is due to conclude the

Although the results are likely in be published eventually, the EPC sponsored conference will be the first opportunity to assess the group's findings, which are used on a survey of 85 institutions in Furgree 1

ons in Europe, the US and

According to the EEC, the

my on the evolution of LSI

08,000 study in September.

cation of computer nided

and display of text.

Professor Griffiths, whose talk is entitled Program Transformdevelopment of languages similar to those involved in the US Defence Department Ironman pro-

standard alphabet and keyboard

teams also shared a number of

The standard will include a

section covering systems for in-

formation retrieval, which

the recently formed UK group is

Use of the language would by

no means be restricted to com-

puter professionals, noted Card.

dominantly secretaries and

clerks. Such users, as well as

those more experienced, found

the differences between existing

systems very difficult to work

The primary thrust for the

Some indication of the in-

tended shape of the new langu-

age is provided by systems that

These include Honeywell's

GCOS text editor, IBM's ATMS.

OED from Bell Labs, MIT's ex-

pansion of QED-QEDX, NLS de-

Research Institute, Wylbur,

give its results to EEC in November

Digital electronics CAD consortium to

e group has already studied.

standard had indeed come from

the end-user community.

would include pre-

participants, he said.

Ansi moves on standard

text processing language

which was working on a the facilities of such systems,

ntion, has been working on the

## Details of US micro development tools a very comprehensive range of

software house in Waltham. sharing services. Massachusetts. The systems, which are sup-

said Card. He added that the

level at which the standard was

expected to operate could be

machine tool standards esta-

processing systems might

choose to use the new language directly, he observed, or could

Similar considerations applied

systems, such as Lockheed's

Dialog, where the committee

was concerned only with the

way in which a user made his

In the case of computer

graphics, the committee did not

ntend to deal with actual con-

structs, he noted, but it was ex-

pected that interchange

mechanisms could be specified,

which would be resolved by a

environment could not be pre-

dicted with any certainty so far

in advance, he said, but would

almost certainly range from

networks of microprocessors to

In addition to presenting the

results of the survey analysis

the symposium will include dis-

cussion of the state of the art in

present technology, and identify

problem areas and possible EEC development actions in this

Presentations from consor-

tium team members will be

complemented by contributions

from invited speakers world-

wide and EEC officials. Among

the former are Professor Lewin

from Brunel University, Profes-

sor Szygenda from Texas Uni-

manager for Intel in the US.

addressed to Keness Belgium

Congress SA, Rue de L'Industrie

versity and W. Lattin, CAD.

The typical implementation

provide a suitable interface.

blished by APT.

compared with that of the

Thus, implementers of word-

Equipment and Data General microprocessor software deve- machines, are also available on lopment systems produced by a several international time

character set requirements for

text and word processing. The

text processing language was to be based on the 96 character

Ascii standard, Ansi X3.4-1977.

Requirements for word-

processing systems were in

general thought to be rather larger, he said, including for

example foreign alphabets and

scientific symbols. Conflict in

this area had already taken

place between the two groups.

The proceedings of the com-

mittee, which has met twice so

far, will be in public and are

has been opened by SPL in

Abingdon, Oxfordshire. An early

project for the centre, to be

staffed initially by 30 senior

consultants from throughout

the company, will be the

SPL opens research centre

Developed by The Boston

linkage editors and simulator debuggers for most current

Devices supported include those manufactured by Advanced Micro Devices, AMI.

Ventek's

IBM RJE

SINGLE software package apable of emulating severa

eleased by Ventek for its Onto

point systems. The program Multiple Terminal Operator

nllows the operator to select either IBM 2780, Hasp, RES, o

JES workstation emulation. In a typical MTE implement

ation, said the company, the

operator keys in data locally to update or create data files.

Thomson CSF and Zilog. The tools, which are all write ten in the host computer's embler, run on PDP-8, PDP-11. the DECsystem 10 and 20 Data General computers which can host the software include

Semiconductor, RCA, Rockwell

Synerick, Texas Instruments

For the most widely used inicroprocessors, BSO in addi-tion offers high-level language facilities. These include crosscompilers for Fortran IV and

the Nova, SuperNova and

Pascal as well as Basic. Features of the crossassemblers include conditional assembly instructions and macro capabilities based on string replacement of argu

They also have the important ability for RAM/PROM segmenting, so that program and data sections can be directed to When ready for transmission to the mainframe, the system diseither random-access or read-

only memory as appropriate. lays to the user a menu c Because they are written nission options. in assembler, the crossassemblers and simulators offer the appropriate emulation mode by a simple keyboard entry. major savings in CPU time over MTE operates on Daton similar products implemented in 1130, 2200, 5500, and 6600 systems with at least 16K bytes

high-level languages. For example, the crossassembler for the Intel 8080 has een shown to produce a reducion of 20 to 1 over Intel's own 8080 cross-assembler, written in Fortran. Other tests have shown A SOFTWARE research centre implementation of a real time a reduction of us much as 70 to 1.

The company, which is actively seeking an agent in the time sharing networks through which the software could be accessed in Europe.

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Layton ... at presentation of the

product specification and syn-

ability; layout; integrated CAD systems; custom LSI economics;

thesis; modelling and logic jects Bureau.

## A HIGH LEVEL user-priented The package, which is supplied to users free of charge, voicing, stock control, and

programming language has been introduced by lacquard within for users of the 1100 within for users of the 1100 within for users of the 1100 within Research Ltd, of London has produced a range of the which run on both 150 and the last them.

he new Jacquard tanguage, whas Data Rite, is intended liquisity for handling displies and data entry pleations. The control of leations Typical applica-sition by the company in the order entry stock stones ganeral office

consists of two main com-

ponents: Data-Form for hand-ling VDU formats and record layouts; and Data-Talk, a command language for handling in-put and output. Data Rite also supports infor-

mation sharing in a network of linked to a mainframe. In the and report formats using and report formats using and report formats using and report formats using and report formats. offloading of mainframe jobs to currently with standard Jaca 3100 in gradual steps, notes the quard systems such as the word company package Type-Rite Compaty.
Packages available from the

purchasing functions as well as the sales, purchase, and nominal ledger accounting.

Also available are systems for budgeting and financial modelling, management accounting, and product costing. The software, which allows

the user to design his own screen

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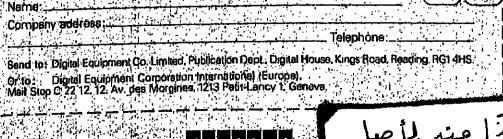
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هدا مند المذصل

MOD approved further input on specific applications.

processing equipment

advice on word

# Barclays—how many will go to Gloucester?

Barciays Bank will have been relocated to a new site in Glouc-

But new sites need operations staff, and how many of Barclays' employees are prepared to move in accordance with the plans?

The answer is still unknown because since the details of the move were made known, last October, there has been a steady flow of leavers from both the Harlesden and Tottenham Court Road centres. One source told me that the figure is about three

It would appear that a considerable number of staff are none too keen about moving away from London.

However, a spokesman for the bank, although unable to give me the exact figure, said that it does not exceed the anticipated total. Apparently the bank would expect a 20 per cent wastage of operations staff in any

Despite this, the bank is recruiting staff for the Gloucester centre. It is taking recruits from the Gloucester area and on a nationwide basis, in which case the new staff will be employed at the Harlesden site until next April.

The spokesman pointed out that refusal by staff members to the company that employs him. be relocated is in direct contravention of their terms of Indeed, the staff handbook

states that "Every member of staff must be willing to serve at any office of the bank as may be More specifically, all staff

over the age of 25, with the exception of those within two years of the retirement age. must be prepared to relocate. And all negotiations with the National Union of Bank Employees, the staff's official

representative body, are based on this premise. Staff under the age of 25 have the choice of relocating to Gloucester or being placed in another position with Barclays

in the London area. Should they favour the latter, it would mean moving out of computing. The bank has offered the staff a number of incentives:

Firstly, a disturbance allowance, comprising a quarter of each employee's yearly salary. This is modified by having a minimum of £454 and a maxi-

cost of decorating or soft furnish-ing, full coverage of removal

the hire of a van and solicitor's fees, all expenses incurred in visiting the area of the centre with the intention of purchasing a house. The bank is also pro-

For those unwilling to make the move, the bank says that it is willing to compromise. It intends to implement a severance scheme under which staff may stay with the bank until the time of the move. Staff agreeable to this would receive between 13 and 39 weeks' pay, depending on length of service.

has called for redundancy pay in place of the severance money. A vital point here is that the the latter uses a 12-hour rota.

viding day trips to the area.

In past negotiations, the union

In this regard, the bank points out that staff are not being made redundant. It emphasises that the jobs still exist, only in an-

Talks are in progress between the union and the bank on the shift system employed at Harlesden and the matter of sevenday, 24-hour cover at Glouc-

To facilitate the relocation. work and staff are being moved from the Tottenham Court Road site to the Harlesden centre. The shift pattern is a moot point because the former employs an eight-hour based system while HINT OF THE WEEK

#### Make best use of macros to save time and effort

THE use of macros to save opera-tors' time and effort is the basis of a hint sent in by Derek Hower, a senior operator at the Colchester site of McCorquodale Books. The machine is an ICL 2903,

which does not have an operating system and instead runs under a Manual Exec. Great emphasis is thus placed upon the Job Descrip-

tion facility.
Says Hewer, "When running under Job Description, use the copies' option rather than printing on two or three part listing paper. In this way it is possible to get copies of the listing on onepart stationery and so avoid changing the printer too often."

As an example, he gives the following line of Job Description:

By Bernard Allen

XXXXX represents the name to be assigned to the output listing %B<C2>instructs the system to

He goes on, "By using the (in this case %B) the number of copies produced may be altered as required. This is achieved by entering the required number on the Macro Call Card."

He concludes, "This, in Itaelf, can be very helpful when there are several users of the same place of job description, and each has a different copy require-

## Essential skills for a shift supervisor

ability to supervise staff and an awareness of the need for strict security -- these are some of the requirements of a shift supervisor in a large bureau environ-

In fact, his role reflects the size and complexity of the sys-tem, the number of staff under his control and the business of

These points stood out clearly after a talk with Dick Galazka, who fills such a position at the Oxford Circus site of BOC Data-The system is an IBM 370/158

dual Megabytes of storage. There are two CPUs, but at Datasolve they are used together as part of one powerful system;

Datasolve is a bureau, providing online customer services under CICS, TSO, IMS and RJE. In fact, about 95 per cent of the system workload comes via the teleprocessing network.

The customers are paying for a service, and expect to get value for their money. Work must be channelled through the system as quickly and efficiently as

Thus, much of the technical side of his function is concerned with ensuring that the work schedule is adhered to and that the throughput is optimised.
"We have a work schedule

which we keep to every day," But there are occasions when he has to draw upon his techni-

bins, who is data centre manager at the Oxford Circus site.

The back-up facility is planned so that each time it goes into operation, the other users will experience no drop in the standard of the service they get from the bureau.

All users of the back-up facility have a system which is geared to Datasolve's configu-

Says Galazka, "They bring their own system packs which must be compatible with our In the event of the service

processor with six being required when his shift is very beginning right through to its conclusion. First there is the liaison with

the customer who, for one reason or another, wishes to have some time on the machine. In this regard, skill in communication is needed

His technical expertise is then called upon when he has to "split" the system into two separate 370/158s, one for use by the customer and the other to carry the normal workload.

the resources of the system de-

storage I might, for example, give one to the user and keep five for the work of the other

Firstly, he offlines all the peripherals which are to be dedicated to the user of the back-

of the two CPUs. Then he offlines as much storage as is appropriate to the

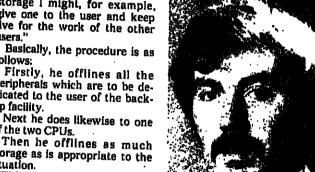
This done, he allows the operators from the user's instaltion to operate the system. These operators work under

the direct supervision of Galazka. The site accommo dates the magnetic tapes of a considerable number of its users and is fully aware of its responsibility in this regard. But let's not forget Galazka's

own team of operators. He has a shift of seven, comprising a shift leader, a senior operator, an operator, a junior operator, a trainee and, of course, himself. Says Robbins, "It is entirely

up to the shift supervisor to de-cide how his shift is organised Says Galazka, "How I share and run."

This means that he is in full pends on the workload I have charge of the deployment of his and on the requirements of the staff, working out who should be



who should work the master console and for what length of

Any person in such a position must use his supervisory and organisational skill to ensure that he makes the best use of his staff's experience and ability, but at the same time give those of the lower grades the chance to do some of the more technical

# Managers must help operators Those who move can claim a cal expertise in a very different. Those who move can claim a cal expertise in a very different. Those who move can claim a cal expertise in a very different. Those who move can claim a call expertise in a very different. Those who management is a very different. Those who management is a very different. Those who management is a very different in a very different. Those who management is a very different in a very diffe

matter from operations managers, who must review their staff regularly and provide

13. Among the speakers will be Walter Hinchman, former chief of the Common Carrier Bureau of the Federal Communications

ture products.

Council moves to Honeywell

Guide to

computer

budgeting

BUDGETING is the subject of

the latest volume in the series,

Current Aspects of Computer

Technology, from Input Two-

Nine. Largely of interest to DP

managers, the book consists of

articles written by a range of

experts, mainly from consultan-

The first part of the book, en-

titled "Monitoring the Installa-

tion", discusses budgetary con-

trol of computer operations and

planning of requirements.

Represented among the authors

are the accounting/consulting

firms Arthur Anderson and

The second part covers

'Practical Alternatives", giving

examples of various ways of

saving money, such as using distributed computing, facilities management, ready-made pack-

ages and time sharing. Second-hand computers, COM, and in-

dependent maintenance are also

among the options put forward.

Electronic

mail study

AN exhaustive study on elec-

tronic mail, including descrip-

tions of the current state of the

art, economic analyses, and pre-

dictions for the future, has been

produced by the Yankee Group,

a consultancy based in Cam-

For \$475 a customer receives

the basic 332-page report, plus four quarterly 85-page updates,

covering three broad topics:

Computer-based message sys-

nunicating word processors.

Each technology is explained in

considerable detail with

The business aims and pro-

pects of the companies in the

field are discussed, and specific

predictions are made about fu-

Yankee Group is holding a

symposium on electronic mail in

New York on September 12 and

examples of its applications.

tems, Facsimile and Com-

bridge, Massachusetts.

Coopers and Lybrand.

cies and bureaux.

MOVING out of its conventional batch processing procedures and into real-time processing. East Lindsey District Council is to replace its four-year-old ICla-, 2903 with a Honeywell Series 60 Level 62 system.

The £143,000 Series 60: machine will be installed at the council's headquarters in Manby, Lincoinshire, next March, and will take on all the current applications run on the rating system throughout the

#### SDI'S GRASP When the London Research Station of British Gas at Fulham.

developed a simulation program for assessing the capacity of gas fields it was given a name which inadvertently resulted in a similar acronym to that of SDI's well-known GRASP operating system extension for DOS and DOS/VS. The British Gas program, Gas Reservoir Area Simulation Program, was one of the items shown when the sta tion celebrated 50 years of research earlier this month (CW. August 3). British Gas has now agreed not to use the name GRASP and thus will in future be used only for SDI's product, for which it is a registered trade mark.

## New trend in hobby shops

Microcomputer hobbyist shops are becoming quite common-place on both sides of the Atlan-it, but Digital Equipment in the UShasstarted a completely new tend by opening a shop that gels commercial systems costing up to \$25,000 (CW, August 17), Located at Manchester New Hampshire, an area with many small businesses, the shop can provide customers with same day delivery if required.

DEC says that it will not turn personal computing enthusiasts away from the shop but doubts if many of them will turn up because the prices of the systems



# Rural experiment in fibre optics communications

da communications experitown in Canada, which Canadan Communications Minister kanne Sauvé refers to as the beginning of a technological redution."

Elie, 60 kilometers from Wandpeg, population 350, will have several interactive com-

a rural communications medium because in a few years it may be cheaper to run a fibre link than a -Growing industry

fill file optics is a growing in-duty which is passing from the exempental to the full producfor stage. Many of the most ex-ding applications of the techno-legy are in inter-city telecomunicition lines, using losers for elected transmission, carrying

mignate along one fibre. Mutere is also a practical use lerker grade optical transmis-ina s з лове immune altern-Moskiel cable in local data akı between terminals and

in the UK s growing number of companies are providing fibre specific and the specific data link made by

name optic doth link made by lask Spice in Leeds sells for 35 p a new and has a bandwidth of 10 MHz for up to 600 metres. Supped price reductions reach 15 p a metre at quantities of 100,000 metres.

The cable comes either with 160 montes of 160 metres. leps mounted for use with a

Attomer's own transmission quipment, or Rank supplies a tankeiter for £49, receiver for (71.56) (71.50 and a range of connectors and couplers for toth analogue and digital communication.

Areas of application include

after and process control sys-tes, since fibre optic transmis-tic provides immunity to elec-tical noise and ground loops and

retrieval, five or more TV chan-

nels, radio and single-party

telephones provided through a

fibre optics transmission system.

optics is particularly suitable as

According to Sauve fibre

Rank puts the world market fo short-hauf fibre optic com munication systems at £400 mil ion a year by 1987, with long haul equipment bringing the total market to about £1,000 million.

Several more firms market similar products — Lee Green Precision Industries and Rodit are two small companies in field -- while larger ones are IT? Plessey, Corning and Pilkington Perkin Elmer. Belling-Lee and Helterman produce connectors and BICC does cabling of fibres

Published prices vary, often because of differences in thickness, quality, coaling, shea-thing and relatorcing. Some com-panies like ITT and Plessey do not publish prices, but will quote only for an individual order.

Oin the US a new company Canoga Data Systems of Canog Park, California has been forme to make fibre optic equip and it expects to market an RS 232C data link before the end of

On the long haul side, Nipp Telephone and Telegraph reports successful transmission at 32 Mbps for over 50 kilometers

rewiring. The overall system ex-

teleshopping and information and the same link could support many other types of com-munication and could triple telecommunications revenue through fees for other services. The large information car-

> rying capacity of fibre optics, and the uses to which this capability can be put means that a much wider range of services could be made available. Sauvé foresees these expanding in the information.

> education and entertainment areas to an extent limited only by the imagination. Initial suggestions include

veterinary and farm management information, consumer reports, games, and income tax The idea should be well

SAUVE . . . beginning of a techno

received in areas such as rutal Canada where a third to a half of telephone subscribers say they are unhappy with the service, compared to only three per cent in town. Thirty per cent of rural subscribers share a line with more than three others.

The Canadian experiment orginated with the Manitoba Telephone System and is supported by the Department of Communications and the Department of Industry, Trade and Commerce. Government agencies and private firms will be invited to provide experimental services to test subscriber reac-

Canada is also experimenting in satellite broadcasting and Sauve suggests that these government backed experiments will bolster both hardware and software sectors of Canada's communications industry and safeguard cultural

## BOC Datasolve upgrades to a V6

a its Amdahl 470/V5 at upgrade of the CPU from a V5 to in.

## Is limits losses from ectronic cashiers

Registation has been Backers of the law claim that wired by the US House of lack of liability limitation is

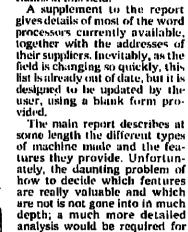
with the prime shift workload According to BOC, the when the V5 was originally put

wached 85% of full capucity.

Boc Dalasolve has upgraded involved the replacement of one involved the replacement of the Amdahl system at multi-chip barrier and some Sunbury makes it more powerful than its dual IBM 370/158 configuration at Oxford Street. The two sites together provide BOC's remote access IBM ser-

# vomen at STC

IN a report to employees from STC, the company claims that the proportion of its supervisors



By Rory Johnston

COMPREHENSIVE advice on

the selection and operation of

word processing equipment is

given in a report' published by

the Local Authorities Manage-

ment Services and Computer

Although aimed at typing ser-

vices staff in local government,

any organisation thinking o

automating its typing could find

the report a useful guide

brought the bewildering maze

of competing products and claims in this field.

The report takes a healthy, slightly sceptical attitude towards munufacturers' claims, however, and users emulating this will be part of the way owards getting to the bottom o

Advice is given on how to improve conventional typing services, and on how to decide

of the organisational changes, training, etc. required is described, together with warnings on resistance on the part of typ ists and authors. Early consultation is prescribed to overcome too simplistic to assume that so iong as you talk to people enough, they will agree with you. For instance, the concern of typists that they may become just machine minders is mentioned, but there is no discussion of whether working a word pro cessor gives more or less job satisfaction than "steam

whether word processors are

really necessary. The planning

Sadly, there is hardly any mention of phototypesetting direct from word processors, which is now becoming a possibility, and will be very useful. It will also involve enormous union problems, as it touches on the printing in

The authors have obviously gone the rounds of the manufacturers assiduously, listened with care to what they say, and generally informed themselves fully about the business. Prospective WP users who have not had the chance to go into the market themselves in detail could do well to read what the Lamsac report has to say.

\*Word Processing, 38 pages, with supplement, 98 pages, is available from Lamsac, 3 Buckingham Gate, London SW1E 6JH, price £4 plus 50p



#### First class operations shift supervisor needed 24 hour day/seven day week/\$2 week year

You may need one - you won get one Ensure the staff you do have fill their hours effectively by sending them on Infotech Operations training courses.

call Phil Cartmell for details 0628 35031 Infotech Operations Ltd.

Operators after complain that according to their point of view.

Well, On Spot is listening and Bernard Allen would like to hear your epiglions and ideal on all matters religing to conspicter operations.

Your letting about he sent to Op Spot, Compliant Weekly, Dorset House, Stanings Breekl, London BEI H.U. Telephone make inceeding welcome and Berligid can be contracted directly of 01-281.

their staff regularly and provide are often too general," he insists, opportunities for both formal According to Johnson, it is and practical training.

These are some of the views of carried out on a regular basis, and time to read those manuals.

Barry Johnson, the operations and he goes on to describe the managers at Sperry Univaria, procedure followed at his site.

West London site is procedure followed at his site.

West London site is procedure followed at his site.

West London site is procedure followed at his site.

"Management must be in a position to provide answers to those questions, and time to read those manuals.

"Managers and supervisors must encourage their operators to break away from solely monitoring the system. As a result of this, the staff's thirst for cerned. It is a two-way affair, greater technical knowledge will increase."

my experience, the appraisals made by operations managers are often too general," he insists.

attempted the define some ways in which has disress of operations staff might progress. It is a two-way affair with each of the parties having the operations by referring directly to some of the points I made in that picket. Says Johnson, "Over the past three wears I, have employed similar methods to those outlined in your article." His ylews on staff training are strong, and refreshingly honest: "In general, the training of operator has a testak of this, only one operator has past dinto such areas as consultancy, engineering and systems analysis."

Liowayst, he believes that I should have placed greater analysis."

Liowayst, he believes that I should have placed greater such of the parties having are strong, and refreshingly honest. "In general, the training of pay a mileage allowance to its operator happy without playing any significant part in the operations analysis."

Continuing in this vein, he says "Operators should be given as peofited objective to the sender own transport. "Continuing in this vein, he says "Operators should be given as peofited objective to the provided."

Says Johnson, "Over the past three was appressed."

His ylews on staff training of staff is general, the training of pay a mileage allowance to its shift workers who have to use their own transport in the absolute analysis."

Continuing in this vein, he says "Operators should be given as peofited objective to the sender own transport."

Continuing in this vein, he says "Operators should be given as peofited objective to the sender of public transport. "Coventry."

Coventry Based provided."

In my place on careet program of the right attitude prom-operations staff, led on ment of the right attitude prom-operations staff, led on ment of the right attitude prom-operations staff, led on ment of the right has been defined by the shift the operator and the other with the says of the fact that to a staff the provided in the staff that the other search of the provided in the operator and the provided in the staff that the operator is a speci

"It is not just a case of the operators taking the trouble to read manuals and ask questions,

## pocsays that 11 to 13% of this pansion will involve no increase in the total physical size of the wied by doubling the size of the light speed buffer in the CPU cabinets to accommodate the extra memory were installed extra memory were installed

history the US House of the state of the sta he almoint an individual tronic cashiers by the public.

tronic cashiers by the public.

The law also applies to such automatic services as direct destronic cash dispenser by for bit and credit transfer. As well as bit and credit transfer. As well as bit and credit transfer. As well as bit and credit transfer as which, although low, compares which, although low, compares savings banks and "savings and distry average.

This will be the first federal final categories STC employs law to impose limits on such law to impose limits of their own.

Position of

hindering acceptance of "electronic cashiers" by the public.
The law also applies to such automatic services as direct de-

## **PEOPLE**

## Belfast bureau to run 333 miles for charity

ised by Independent Computer Ser-vices of Belfast will cross Ireland diagonally from the extreme northeast to the south-west, and will cleaners, managers and operators, will be represented,

September III. ICS hopes to raise £5,000 from the run, to be divided between the Northem Ireland Association for Spinal Biflda and Hydrocephalus, the Nor-thern Ireland Leukaemia Research Fund, St Anne's Skin und Cancer Huspital, Dublin and the Balintemple Spastic Clinic, Cork. The runners, divided into three teams, will each run one or two 30-

Geoffrey Stearman has been appointed marketing director of Feedback Instruments, and will continue as technical director. Trevor Anderson has been promoted from assistant developmen manager to development manager of Feedback.



Stephen Hill, previously systems manager for Fine Fare, has become data systems controller for Lad-brokes holidays and hotels division.

Poter Clements, previously opera-tions manager with On Line Sys-tems, has joined ADP Network Services as European operations

Plessey director retires A CAREER spent entirely in telecommunications has ended for John Ireland, who retired as director

of trade relations and projects of Plessey Telecommunications Inriessey Telecommunications In-ternational recently. The gained an engineering degree from Imperial College in the 1930s and spent two years with STC before joining the Royal Corps of Signals in 1939.

During the war he attained the rank of Lieutenant-Colonel and in 1946 was awarded the MBE for the part he played as second-in-command of the Second Army Signals, in providing communications during the Normandy landings and the advance into occupied Europe.

Europe.

After several years with the Post
Office and Cable and Wireless, in
1953 he joined AT&E to lead the
System Planning Group set up

jointly with BICC. In 1959 he became chief engineer. In 1959 he became chief engineer, and when AT&E was acquired by Plessey, held both technical and marketing appointments within the

Old Bushmills Distillery in Co An-trim and Three Stripe International in Co Cork, ICS' northernmost and southermost customers, are the starting and finishing points of the Donations will be welcomed, and

for Nelson Millar will lead one of the

teams, and every section of ICS'

staff, including programmers,

should be addressed by The Secre-tary, ICS Marathon Charity Run, c/o Independent Computer Services Lul, Queen's Road, Belfast BT3 9DT.

same post with Computer and Sys-tems Engineering. Alex Park has joined STC as director financial controls. He has peen retained as a consultant by Lonrho since March, when he gave up his job as chief executive of

Colin Hughes has joined Anderson

Jacobson as financial controller and

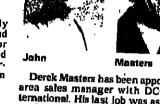
company secretary, after holding the

Derek Newman, hitherto group controller of management services with Racal, has been appointed to the board of Racal Circup Services as ector of management services. This is a newly-created position.

British Leyland.

Tony Woodiwiss, previously regional manager, government and public corporations division for Redifon Computers, has joined General Computer Systems as ter-ritory manager for the Eastern counties and North London.

John Thomas has left ICL Dataskil, where he was supervising fac-tory trials of 2970, 2976 and 2980 systems, to become operations manager of Safe Computing's bureau services division.



Derck Masters has been appointed area sales manager with DCC international. His last job was as sales engineer for MDS. Carolyn John, formerly software development manager of Leasco Software's minicomputer division, has DCC as a software consultant computer division, has joined

**Eric Willis-Jones** 

THE death has occurred, at the age of 52, of Eric Willis-Jones, a

member of the executive board of Thorn Electrical Industries

nd chairman of Thom's indust-

and chairman of Thorn's industrial control engineering group.
He became head of the measurement, control and automation division after reorganisation of the Thorn Engineering Group in 1972, and was appointed to the executive board in 1973.

He was a past president of SIMA, a council member of

BEAMA, CAMA and ECIF and a

member of the executive com-mittee of the EEF (London

Association). He was currently serving on the NEDC Automation and instrumentation Sector

Working Party for the elec-



National Management Game winning team from Shell receive a £1,000 cheque and subsidiary prizes from (right centre) Harold Lever, Chancellor of the Duchy of Lancaster, and (left centre) Fredy Fisher, editor of the Financial Times. The team are (left ro right) Nigel Warner, Geoff Brown, Lech Zwierzynski, Steve Phillip and Gijs Surie.

Harry Bradley of RCA has been appointed marketing and sales manager. Until recently he was tachnical conductor of the sales are the sales and the sales are technical services manager.



AUGUST 28-SEPTEMBER 1
Eighth Australian Computer Conference, Australian Computer Society.

Jackson design technique, management tutorial. Marcus Bromberger. Dept of Computer Science, University of Strathchyde, Glasgow. 9.30. Details from the Continuing Education Office at the University, tel: 041-052 4400, ext 2132.

AUGUST31
Program transformations, Prof M.
Griffiths, BCS Formal Aspects of Computing Science Group, Polytechnic of Central London, New Cavendish Street,

Central London, New Cavendian Street, London Wi, 18.30. SEPTEMBER 4-8 Medical Informatics Europe, congress. European Federation for Medical Com-

Compcon Fall 78. IEEE Computer

SCI

£739

Dennis Papworth has become sales manager with Gamma Associates. Previously he was sales manager with Honeywell. Appointed sales consultants with Gamma are Mike Caine and Keith Turner. Caine was formerly northern region sales manager with Honeywell, and Turner was a senior sales consultant in the East Midlands with Honeywell NISD. **Obituary** Midlands with Honeywell NISD.

AUGUST 29

puting. Cambridge. SEPTEMBER 6-8

#### Shell winners of National Management Game

THE 1978 National Management Game was won by a team from Shell UK, whose "company" made a profit of £8.1 million. Second, third and fourth places in a close contest were held by teams from IBM, chartered accountants Thornton Baker, and again IBM.

The winning team will represent the UK in the international finals. the European management championship, which will be held in Stockholm on September 8-9. The Game is sponsored in the UK by ICL, the Financial Times and the

Institute of Chartered Accountants in England and Wales, in association

## Redifon branch in East Anglia

AN office to service Norfolk, Suffolk AN office to service Norfolk, Suffolk and Cambridgeshire has been opened by Redifon Computers in Stowmarket. Ken Bowman, territory manager, will be in charge. The address is 37-39 Ipswich Street, Stowmarket, Suffolk IP14 1AH. Tel: (04492) 5294.

At Redifon's Crawley HQ, Andrew Roberts has joined as a product marketing specialist. His most recent job was that of sales executive with Olivetti. Philip Warner, lately a salesman with M-ler, has become territory manager for the South-East branch with Redifon, and will be based in Croy

Computing Centre. Riccarton Campus Heriot-Watt University. Edinburgh.

SEPTEMBER 11-12

SEPTEMBER 12

California. SEPTEMBER 13



with the Confederation of British

Industry and the Institute of Direc-

The countries taking part at present, besides the UK, are Denmark, France, Germany, the Irish Republic and Sweden, but it is hoped that

many more countries will join in

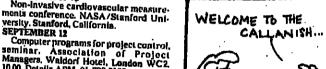
All the participating countries use

the Nimex program, which was or iginally developed by ICL for the UK Game.

Details of the 1979 Game can be

obtained by telephoning 01-242

next year.





20.00.
SEPTEMBER 19-21
CAD/CAM, computer-aided design and manufacturing conference, and skibition. Computer and Automated Systems Association. Los Angeles.
SEPTEMBER 28
VME/K subgroup meeting. 2900 User.
Group, National Liberal Club, Losdon
SWI-10-30.

SEPTEMBER 11.33.
Symposium on interactive sechniques in compilier-aided derign. IRES Compilier Science Sectors (RES Compilier Compilier Compilier Communication Conference, ICCC 128, international Council for Computer, Communication.

SEPTEMBER 27 elleent terminals in information sval. BCS information Retrieve

# Pay is the key to DP staff shortages -SAYS LOCK GROUP SURVEY

"until some relaxation (in pay

restraints) occurs there will

vided by over 50 companies and the records of candidates regis-

tering with Lock Management

Personnel Group regional

At the bottom end of the pro-

grammer section, a trainee pro-

grammer aged 17-30 was ear-

ning between £2,250 to £3,250

while at the top, a systems pro-

grammer aged 20-35 was at £5,500 to £8,100.

An unalyst/programmer (22-34) earned between £4,500 and

£5,900 and a senior systems ana-

lyst (26-37) between £5,500 and

a project leader (25-42) was

**Bugs** in

system

These conical

to test the

logarithmic spira

intennac are uso

effectiveness o

hields against

radio interference Originally developed for the military, they are

seen here being used by Richard

tonoywali Leval 6

ninicomputer at loneywell's plant

The company also uses them with

terminals, printers and mainframs

Hotz with a

carning between £4,500 and staff.

vacancies.'

The salary of the average an- £7,500 and the most senior per-

flation, says the survey, and mand between £7,500 and

Actual salary figures for the various DP job descriptions are the £2,450 to £3,550 salary range for production/data control

based on data collected during staff (18-30) and the £3,100 to

March and April and are an £5,300 range for a data prepara-

For operations and data pre-paration staff the pay scales

were much lower, as shown by

A trainee operator (17-23)

The bottom end of manage-

ment positions in this field, the

chief operator, had a range of

£3,450 to £5,300 while at the top

the operations manager/

controller (23-50) earned bet-

In addition to computer per-

sonnel, the survey looks at

accountants, company secre-

ween £4,700 and £8,160.

could expect between £1,950 and £3,250 and a shift leader (20-31)

between £3,600 and £4,800.

tion supervisor (21-50).

seems to have been "something of a brake" on salaries of DP personnel, according to the latalyst, programmer or operator has failed to keep pace with inest bi-annual saluries survey carried out by the Lock Management Personnel Group, of Guildford.

The survey, which covers the continue to be many unfilled south and south-east of England (excluding central London) says that selaries increased in the 18 month period under review between 13% and 20% for most lobs with the more senior people amalgam of information proreceiving a higher percentage and exceptionally, the median salary of management services managers has gone up 38%."

A further observation is that "It appears companies are prepared to run their departments under strength rather than risk disrupting their salary struc-

#### **NEWS IN BRIEF**

#### Survey of DBMS users

ASURVEY of users' DBMS experience in the UK and Europe is whe conducted by the Butler Cox Foundation, the research association of Butler Cox & Pathers, Based on a brief quesdonnaire with only eight questons, the survey aims to measus the success of DBMS implementation and the overall dente of user satisfaction.

Results are to be tabulated wording to the DBMS product 🖼 Questionnaires are curmybeing mailed to about 300 someoles in the UK and lims and firms wishing to asm that they are included have been invited to contact baker. Cox & Partners

#### Meturbishing

DISC drives and storage nodules from most of the well mown manufacturers can be furbished and upgraded by Shirom Ellinor of Reading, the UK representative of the USased refurbishing specialist. lens Datacorp. Sintrom says liet damaged or worn heads and sindles can be refurbished at setween 30 and 50% of the cost of new parts.

#### Systime system

REPLACING a combination of mean services and accounting machines, Needlers, the Hullbred confectionery manufac-luter, has installed a Systime Series 3000 system worth 14,000 It will handle order procasing sales, purchase ledger and hominal ledger applications or the company, which has a tistof over 14,000.

If you are finding that the capacity of Your mainframe computer is limited then perhaps we can provide the answer.

melead of replacing your mainframe a more cost effective solution could be

to add a local MORD computer system. Extra capacity can be added to suit your own particulal requirements.

Word processing conference dates ANOTHER conference on word Tom Stewart from Loughbo- He will talk about office processing will be held at the rough University, and Pat Coen from Logica. Norah Barckley of Regent Centre Hotel, London, on October 30 and 31. Organised BSI, Shirley Pickard of ICI, and Dorls Lenson, formerly of the by Information Studies, the AA, will give first-hand ex-perience of the introduction of meeting will be called "Word Processing — the Human Di-mension" and will be aimed at WP in their organisations, A newcomer to the WP scene

will be union man Barrie Sherof word processing systems, disman, research director of cussing the selection and use of ASTMS, who has gained a Several pundits well known reputation in the computer from other conferences will world for forthright and intelligences, including ergonomist ligent views on labour matters.

What is more, the NORD system can white performing local processing act as:

RJE - terminal offering simultaneous communications with most machines -

IBM, UNIVAC etc.
NORD computer systems are used in

industry, commerce, research and education throughout Europe,

current and potential managers

Extra capacity for your mainframe

NORD - the system to build upon.

Bichard Norton (NORD) Ltd. NORD House, 17 Balle Street,

Landon Nj. Tel.: 01-2785501, telex: 299 537

Over the two days of the conference there will be round table discussions in addition to the formal sessions, to enable participants to air their own views and problems. They will be asked to complete a question naire before the conference to make clear their needs and ex-

Attendance costs £225 plus VAT. Further information from information Studies on Chor-

#### Secretaries opt for Data General

SUBSCRIPTION accounting and management information for the Institute of Charterec Secretaries and Administrators will be provided by a Data General Nova 3D computer and

General Nova 3D computer and Data Logic software.

The \$140,000 turnkey contract awarded to Data Logic follows a feasibility study by Cambridge Data Processing on the computer handling of records and bulk institutes for \$0,000 members and 1,000 stitutes the provious system in volved feasibility feasibility and the state of subscriptions by a bureau.

## **GDC** chief condemns 'predatory' takeovers

A NEW legal framework which would make it more difficult for contested takeover bids to succeed is being considered by a US Senate sub-committee.
William Norris, head of Control

Data Corp., told the sub-committee that the capture of a firm by a richer one reduces employment levels, destroys jobcreating resources and disrupts employee careers.

He suggested that shareholders in predatory com-

bids. A social impact analysis o before the acquisition was made and a copy should be provided to

Earlier this year, Control Date shoreholders agreed to an amendment in the company's articles of association designed to make it harder for CDC to be taken over (CW, May 18).

## Canadian bureaux fear competition from the banks

are worried that proposed legis-lation there would allow banks to compete with them in providing data processing services. Proposed changes to the Bank Act are not specific enough in their stipulations, claims Derek Price, president of the Canadian Association of Data Processing Service Organisations.

NORRIS

Amendments to the Act as at taries, personnel management. sales and marketing, manufacresent put forward state that turing management, design banks may provide "bankingmanagement, and administrarelated data processing sertion, clerical and secretarial vices".

Price wants the law to list

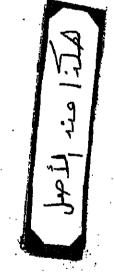
CANADIAN computer bureaux specifically the services allowed. such as "the classification of deposits and payments, pre-tion, concentration of economic authorised debits and credits. payroll preparation plans, and data processing in connection with a factoring service".

This would be in line with a

about possible unfair competipower, and conflict of interest.

Adapso in the US is also con cerned about competition from banks, and is suing a New York White Paper issued in August bank in a test case (CW, July 7).

If you think you have found the most cost effective key-to-disc system from the world's leading supplier, and it's not from Inforex,



Think again! About cost effectiveness: from inforex you can get a complete three key-station system for under £10,000. Think delivery again: you could do away with punched cards by the end of the month. Think again about service: a Tellable, well proven range backed by a national service team. Any way you think about it, inforex offers the best available solution. The world's leading supplier, with over 4,500 systems worldwide, will take you from punched cards to key-to-disc (expandable to meet your most exacting requirements), to data management and to distributed processing with a compatible product range and the support to make it happen. Telephone inforex at 01-863 831 ); or send the coupon for full details to: Inforex Limited," Data Management Systems Inforex House, Headstone Road,

think again!

Rease send me further information on Infolex key-to-disc Name Company size in the Company of the



also ADM - 1A,2,2B DRILLICG EAR SIEGLER 200 LAMANNA £1685 £895 add ASR to your KSR 30 cps punch reader

IMMEDIATE DELIVERY Link House, Pool Close, West Molesey, Surrey

Telephone: 01-941 4806 Telex: 922175



QUANTITY DISCOUNTS





## Computer shop to open in Luton

the target opening date for a new personal computer shop for the northern home countles market. Though a lease has still to be signed on premises, the new hop, laherwoods, based in Luton, will be selling a wide range of hardware from Commodore's Per, up through the Apple II to the Sol and Cromenco systems, distributed in the UK by Comart.

Leading lights behind isher-woods are Bob Crook, an exidvertising exocutive who currently has his own company, RIIC, selling programmable cal-culators and cost estimating packages to the printing industry, and Robin Woods who, until recently was personal computer product manager in UK for Texas struments, and now has formed

his own company, Robin Woods Personal Computer Consultents. Crook and Woods have also formed a joint company, RiiC Business Systems, which will

which will range in price from the Pet at £695, through to systems costing around £10,000, isherwoods will have a strong bins towards the development of packaged software for business and professional applications. Crook indicated that several software consultants were currently working on specific projects such as stock control and payrol pockages, and said that the ive was to have them available off the shelf, and at low cost

Despite this bias, the shop will be selling equipment right across the hobbyist and home user. Stocking orders have already been placed with Commodore, for the Apple, Commit for the Sol, niso for North Star and

The second market is the small

will require excellent operating software to handle large data-

The third market sector is the

\$200 to \$500 system suitable fo

such applications as domestic

cash flow, tax planning, and in-

PROGESTIVE: SYSTEMS

#### **Texas: Three markets**

AS the ex-product marketing manager of personal computers for Texas Instruments, Robin market, which is seen as requiring final to the computer of the compute market, which is seen as requiring flexible programming and a high order of computational ability. Woods has an intimate knowledge of the company's thinking in this area, and is keen to see the planned systems being sold commercial business system. Here, the computational require-ments are low, but the system

through the new slipp.
According to Woods, the pro-jected Ti range of hardware is due to be launched, at the latest, by the end of this year, with autumn

the most likely time. From a variety of published home, and according to Woods, Ti's thinking here is for t nct markets have been identified, and that the company is probably planning to introduce

In addition to the hardware set to launch the product on the open market.

plans to sell its hybrid memory.

some European customers.

The device itself consists of two I6K dynamic RAM chips mounted side by side in an 18-

This design was hoped to meet IBM's requirement for "doubled-up" hybrid memory packages, and followed a pattern set by Mostek last year, with a side-by-side configuration using 4K devices. This was originally developed to meet a specific customer requirement, and was later made available on

IBM, which favours such

# Mostek set to market 32K hybrid RAMs

to buy 4K static RAMs from uses 2K devices of its own part (32,768 bits) is 215. Intel (CW, July 13), and the conjecture that the same would soon be happening in 16K RAM. dynamic devices, with two chips mounted together to form a 32K hybrid, one of the contenders for this upcoming IBM order is now

That contender is Mostek, which according to US sources, has already lost out in the IBM race to Intel and Texas Instruments, so the company now

vice-president of Mostek, confirmed last week that the the only memory maker prememory has been produced, but pared to introduce a 32K bit said that there are no sales or marketing plans for it, and no pricing structure as yet. There are indications, however, that it is already being mentioned to

pin dual-in-line package.

the open market.

manufacture in packages that contain 4 chips, giving an 8K

Both Intel and Texas Instruments have gone for the alternative solution of stacking the 16K chips, one on top of the other in an 18-pin package. This is favoured by IBM, and has been christened the IBM "Love

bug" by the industry. At first sight, this move by Mostek seems a little strange, for several reasons. First and foremost, it puts the company in Dietrich Erdmann, European a somewhat isolated position in the market, in that it seems to be

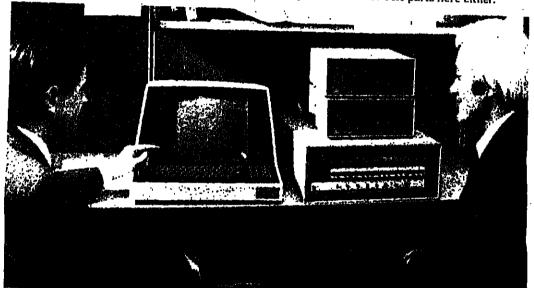
The second important consideration is that, historically, memory components with capacities that are not even

appearing about the market This is borne out by the prospects for a memory as big as relative failure in the market of 64K, a subject now close to the 512-bit, 2K and 8K RAMS, as heart of the UK government.

**Edited by Martin Banks** 

With the majority of micro-On the plus side, however, is processor devices and applicathe fact that even though IBM tions to be found outside the DP has chosen the 32K size only for industry, it is interesting to note internal use, it is big enough to that a market survey, attributed make it a de facto standard. to National Semiconductor, On top of this is that by using suggests that the average read/ existing devices, albeit in a nonwrite memory requirement in standard package, Mostek will such applications is 128 bytes. provide an effective means of From this it is possible to see increasing memory capacity at low cost. And unlike IBM's 2K/ that a 64K RAM would be something of an overkill, and 8K configuration, which did not during its early days, an expentake off in the marketplace, this sive one at that. new memory could well do so, if

If IBM, still "the" computer only because IBM is obliged to manufacturer, favours 32K as a buy the devices on the open memory size, it is possible that market, rather than manufacmany of its competitors may start feeling the same way. One final factor in its favour, a Should that happen, then there capacities that are not even number powers of two have point related to its low cost and might not be much of a market for 64K parts here either.



ture them internally.

opposed to the 1K, 4K and 16K

Experience is a great teacher, as the staff at BIS Applied Systems are finding out. This Alteir 8800b system, plotured above, which is used for basic research, as well as demonstrations on public courses run by the company, is also being used by the BIS staff as a tool for self-learning.

The aim, according to BIS director Garfield Collins, is to help the staff assess the place of the micro in

## Now Intel plans its assault on the next 10 years

WITH 10 years of operation be- ure itself to the needs of the task hindit, Intel is now gearing itself for an assault on the next 10 years of development in microelectronics.

Speaking last week at an another in the system would configure itself as such a machine. If the next task called for a single 32-bit "number cruncher" then the system would configure itself as such a machine. If the next task called for a single 32-bit "number cruncher" then the system would configure itself as

Tom Lawrence, vice president and director of operations for ntel in Europe, pointed to appear areas where, he thought ich innovation would come.

While declining to confirm that his thoughts were representative of committed research programmes within the research programmes within the company. Lawrence suggested that one of the next big developments would be in dynamic reprogrammable architecture in microcomputing

preferably working in parallel then that is what the machine would become: . The company also sees conderable importance in the future potential of the telephone and television as input/out While keen to maintain its position of market leadership in

required several 8-bit machines.

the microprocessor business. Lawrence indicated Intel's awareness of the change in This he felt, would involve the that the next 10 years will market and product emphasis

This, he felt, would involve the development of microprocessors that the next 10 years will that would adapt their architecture to suit the particular task required to be performed. Where this would be most relevant would be most relevant would be in dispersed multiple memory replacing core, and approach to computer, as it is cuirently conceived. The computer of these areas would continue the maintrame computer, as it is cuirently conceived. The next 10 years will be product market, with deep largely in the replacement products market, with dynamic random access memory replacing core, and microprocessors replacing core, and microprocessors replacing core and interprocessors replacing core and microprocessors replacing core and microprocessors replacing core and interprocessors replacing core and microprocessors replacing core and microprocessor

#### **Uister puts** £75,000 into micro firm

FOLLOWING the lead set by the Department of Industry and the National Enterprise Board in me National Enterprise Board in-funding advanced technology microelectronics, the North-ern Treiand Development Agency has also got into the act with the provision of \$275,000 for a new company. Power Autometion Products, to

The company has stread been operating in Canada for s while, with a Northern Ireland local man, John Cunningham, a its head, it has noted as a mai keing company for the system, which has been developed and manufactured by a Lisburn-based company, Medical and Scientific Computer Services.

The plan is now for PAP to take over manufacture with Development Service and page 1986 for the page 1986 for PAP to take over manufacture with Development Service Page 1986 for PAP to take over manufacture with Development Service Page 1986 for PAP to the PAP to take th

take over manufacture with Development Agency backing, a move that should create initially about 25 new jobs in the area. The system itself is essentially a sophisticated monitor for public utility power transmission systems. Sated on a Motorola 6500, it manitors the power these and when a feut is detected, storge for later analysis the wave form of the transmission prior to, and

transmission prior to, and immediately affect the fault occurs. It has already been sold on the North American market, and PAP plans to expend sales into South America and Europe.

## PERSONAL COMPUTING

To some extent, the Personal Computer has ance of the decreasing size of computing tations of midnight soldering by wild-haired scope of the market for such equipment, population to latch on to the microproces-that can claim to be a "real" computer. sor. in as much as any member of the public tis easiest for them to relate to the import
referred to as hobbyist, with all the conno
This widens considerably the size in the conno-

This widens considerably the size and and scope

capability through a small, desk top system "professors." Certainly, some of the personal computing equipment that is now the market, and the industry making and But even so, there are misconceptions. available on the market falls squarely into salling the equipment, is still relatively new,

#### Applications that range well beyond the the personal computing field are being formed almost weekly is sufficient evidence on the surface that a market for such equipment exists in this country. The size, scope and major sectors of that market, however. home and hobbyist have been harder to isolate and quantify in the past. That is why a small survey of the industry was undertaken, to my and establish some basic

the second year of the survey. This is not surprising in view of the fact that, as a very new industry, it has precious little time to look beyond the immediate struggle to establish its individual operations. They all however, have a more considered view on the future and its prospects, otherwise they would

not have entered the business. For the 1978 total market, the average of the estimates given was, as stated, £5.5 million. The variance between the different answers, however, was particularly marked. They ranged at the lowest from El million, to "at

with such statements as "prob-

Despite what might appear to

be a respectable rate of growth

for a new industry, several com-

ably at least . . .

Muntingdon (0480) 215005-

bringing it up to £37.5 million.

Personal computers are already finding a wide runge of beyond the home and the hobys, so five main sectors were selected to point to the main Miss where the equipment is market is expected to rise to £37.5 million. Here, the variance

The first was the hobbyist/ whiter market; this was folby the industrial/ onal market, education. and other - a cutch penny for he many esoteric applications but he being tried at present. At the industry is still young, was to be expected that the pinions of the industry would ray considerably. That this was som be seen from the survey

facts and figures. The survey was undertaken on the basis of

the industry's own views of the

The most important fact to be established, slily as it may seem,

was that the market for personul

computer hardware existed at all Even so, at a total estimated

value of £5.5 million this year, it

The industry that makes and

sels the equipment however, is

confident of the future, for in

two years time a growth of 682%

in the market is predicted,

isby no means large.

market and its movements.

fault of both the sellers, in terms of pricing and approach to the market, and the perhaps natural reticence of the potential buyers

By Martin Banks

dustry thinks this growth rate is this sector, which could partly slow, it is undoubtedly a rate be accounted for by different that will cause considerable problems for many of the companies operating in the business. least" £10 million at the highest. By 1980, the average total

There will be many organisational problems to be overcome to keep pace with the market, and as the numbers increase of users with no previous was smaller, ranging from £20 electronics or computer exmillion at the lowest, to £50 milperience, the total cost of "serlion at the top end. Though vicing" those customers will relatively closer in opinion grow in importance. about 1980, it was noticeable This will come as education as that the market was still being guessed at, and many respondents prefaced their estimates

part of the sales cost, and in back-up service and mainte- this sector. Even if this is maintenance by

replacement, it will be expensive, and it is possible to predict that some of the current com- year". At 35% share however. panies in the field, both selling and manufacturing, will drop by the wayside by 1980.

Education, the next biggest sector, has an average estimated

(or lack of it) in selling to

educational authorities and

partly by different regional

attitudes to computing and

computing equipment among

the educational authorities. The

2%, while the highest was 35%.

owest figure for the sector was

market, and were exploiting it share of 23.66% for the current year. There was perhaps the For many, it is a sector that was not considered viable, until

it started making approaches to the industry. Commodors, for example, chose to use the IEEE-488 standard interface with its Pet system, rather than S-100 or any

Several companies within the

sample expressed surprise at the

existence of this sector in the

ther interface. This standard interface is however, the one used by electronic instrument manufacturers to connect different instruments together. Such instruments, connected to a computer system, produce

instruments used in the test

found this sector very visible. By 1980, the sector is still an automatic test system that ng to be an important part of going to be an important part  $\omega$ , the market, with the average can be changed to suit different requirements by changing the

program controlling them. By

choosing this interface, the Pot

can be used in place of the pre-

vious minicomputer hardware

examples of the use of persons

computers in an area that would

not normally be considered as a

This year, the average es-

timate of the percentage share

the industrial/scientific sector is

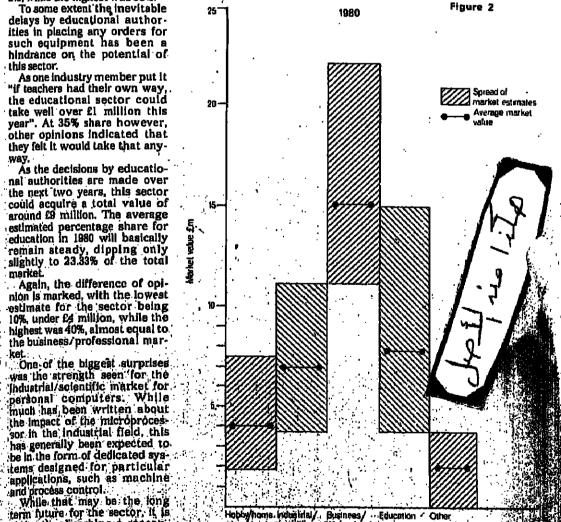
21.83% — around £1.2 million —

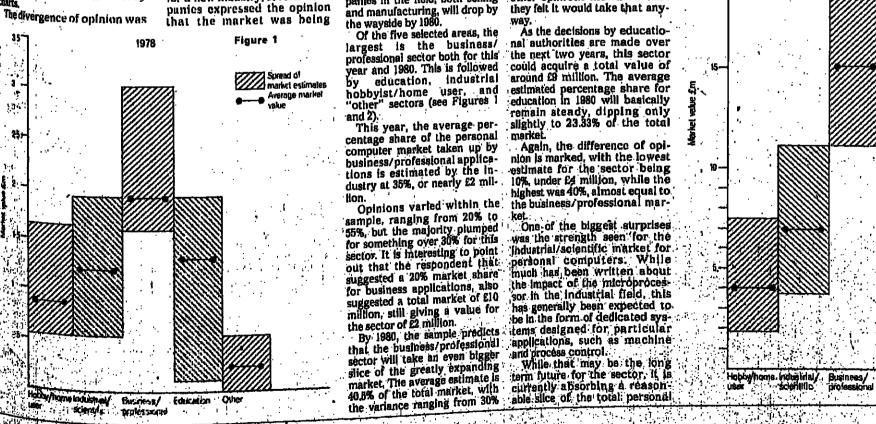
while the spread of opinior

ranged from 10% to 35% All

companies within the sample,

prime market.







SPECIALISTS IN

# Low-cost packages the key

THIS, to some extent, is survey of the personal computer business in the UK - Part Two, for as part of the questioning of the industry sample that resulted in the marketing statistics that appear overleaf, questions were posed about the future, and the product developments that were felt most likely to appear.

While there were several different kicas about what might happen in terms of system hardware, the samples were of one accord when it came to soft-

ware.
Within the next two years, in their opinion, there will develop a tremendous market for packaged software that should be both inexpensive and easy to use, and that enormous potential exists for a new group of entropreneurs to come into the business to write this software.

Although there were degrees of opinion within this consensus view, every manufacturer and supplier of personal computer equipment contacted, predicted that packages software would be a market of tremendous value, and several indicated that it would probably be one of the key factors in the development and growth of the total market.

he prime reason behind this thinking is that the current market consists mainly of cus-tomers that have some knowledge of computers and computing, either directly or through some indirect contact like a relative or friend who has some experience.
There is, however, a very de-

finite limit to the number of people in the country that currently fall into that category and there is, therefore, a potential limit to the growth of the total

By and large, the present market customers have sufficient skill to solve their own programming problems, though this may well be assisted by help through one of the many user groups and clubs that are springing up.

For those without the necessary experience, the only solution to the problems of developing suitable software to complete a system, especially where such software is required in a business or other productive application, is to go to a software or systems house and have the programs written specially. This will usually achieve the

objective extremely well, but the

cost can be prohibitive, more

than doubling the purchase

personal computers, in many

the bigger businesses on a

number of grounds, ranging

from a sizeable saving in altern-

ative operating costs, to the de-

term future use in several busi-

ness areas, the vast majority of

potential users cannot stretch

their resources to cover such

This is why the personal com-

puter business feels that the

potential for inexperienced

packaged software is so big

According to some statistics,

there are around 1.5 million

ment of systems for long

While this can be justified by

price of even the most expensive

Whatever happens to the hardware ages that require the minimum of systems hardware of personal computer systems over the next two years, the big development seen by the industry is packaged soft-

industry as one of the key factors in ware. Inexpensive applications pack-spurring the growth in the market for nobody around writing them.

> Such tailoring, however, would need to be limited in scope, and should not cost much more than £10, and certainly not more than the cost of the original basic package.

also have to be easy to use. This is not so much in relation to the medium used to carry the package. There is already a wide selection, ranging from paper tape to dual-density doublesided floppy discs to choose from, and each has its advantages and disadvantages. It is

requirement for some individual tailoring of the standard package to suit the particular requirements of each individual

Not only will these packages have to be cheap, but they will more to do with the fact that the

tioned was cost. The upper limit on the price of individual applications programs was £25, and some said a figure lower. Each program should contain the basic structure necessary to perform the task required of it, for example a payroll package

is required? The first considera-

tion that the majority men-

The Apple II computer, seen here working in an inventory application, is now to be manufactured under licence in the UK by ITT, the US glant that recently started a marketing operation on the system. The existing industry small businesses in the UK, and new generation of personal truly useful in developing the even a mere 10% of that still computer users will not know, market represents a sizeable potential and will not want to know, murket for both hardware and about the intricacies of comsoftware systems, if it can beputer systems and programs. So what does the industry feel

tailoring to meet individual customers

The need will be for program packages that are loaded reliably with the proverbial "touch of a button," and subsequently do the required task, not so much efficiently, but with the inimum of fuss.

In relation to program efficiency, the majority of the sample seemed to feel that Basic would remain the top language of personal computing, despite for up to 25 employees, but the growth of Cobol, Fortran several companies suggested and Pascal in forms suitable for that there might well be a micro-based equipment.

it is now possible to mount a language interpreter in ROM so

These packages are, however, not requirements are seen by many in the yet with us, and one of the prime reasons is that there is currently

> Some felt that the market was that it is always available as part becoming overskilled with new computing. As each user can possible using just one large

It should therefore be possible

of the system<sup>7</sup>s hardware. This has already been done in

ting to note was that none of the

survey sample, even with some

prompting, thought that firm-

ware packages would make any

significant impact during the

in read-only memories, is not

new as such, for nearly every

microprocessor has an atten-

dent Monitor program in ROM

But recent developments in

both micro and memory design

and complexity have meant that

Firmware, software mounted

next two years.

form to go with it.

some systems, by using several small capacity devices. It is now

entry by Texas Instruments,. which now seems to be forming its plans along the lines of a

with language interpreter and

lerable ease.

application packages with con-

This is obviously an area of

the market that the semicon-

ductor manufacturing com-

panies would be pleased to see

develop. They are, after all, in

the business of selling their pro-

ducts in high volume, and this is

an area where such volume

could exist. If firmware pack-

ages became readily available, i

is certain that the pricing of

them would soon become ex-

Though the sample was of one

opinion in software, there were

several different views ex-

pressed about possible hardware

developments over the next

One suggestion is of particular

importance, to both future cus-

tomers and the manufacturers

and suppliers already in the

business. This is that a "name"

company will come to the fore

during the next two years, and

will become firmly entrenched

as the market leader in hard-

ware - and possibly software as

As to which company that

might be, there were no sugges-

There is also the oft-rumoured

tremely attractive.

couple of years.

range of hardware that will cover professional, commercial lasy to store and re-uscable. and domestic market areas. Other giant companies, such as IBM, are rumoured to be looking at the market closely. The "name" will probably come

and speed, and it is generally ine that you get what you pay fortunately, a wide range of recording standards exist. and, for mass-market distribuion, this may require a large apital investment to cover all of

lal data, such as program loads, hey are very inefficient where nter depend largely on the quality of tape and deck used in

Floppy disc based systems has the range from the top end of the personal market to of the personal market to sophisticated microcomputer systems. They are maily associated with a filing in operating system and the spilal investment ranges from the personal market since second-hand paper tape readers each decrease with the advent of single-clip controllers.

In common with cassettes, and shullar problems exist Randon solutions of standards, and shullar problems exist Randon with cassettes. These are largely published in hobby magazines and revenue is collected from the publisher rather than the condition of the publisher rather than the conditions.

Having chosen the distribu-tion medium or media, it is then monenon has expanded the 256 K bytes of data. They can be easily damaged by a careless appropriate to consider how operator, but are durable with much of the potential product is careful handling and have a low to be distributed. There are error rate. broadly three levels of distribu-The discs are sometimes tion: I Executable code and operating instructions only; 2

for distribution

faulty on delivery, but manufacturers are normally co-operative over replacing them. Ordered storage of discs is easy to achieve. Discs can be re-used, and they can also be physically

of software

PROMs differ from the magnetic media in that they are usually built into the target computer and are usually executable programs such as business users, high/low volume monitors, compilers and video sales, important attached to drivers. They are generally used only for special applications and are usually as fast as the host microprocessor. They are tal question obviously affects very reliable and durable once the package development, but installed, but require specialist

often ignored is its effect on hundling during installation. marketing. This oversight muy have fatal consequences to the PROMs are not re-useable unless they are of the eraseable iv concerned, as lack of variety, which is slower and foresight in marketing may lead more expensive. To program PR()Ms a special programmer is required. This costs in the region The selection of distribution ium should be anything but of £1,000 to £2,000, but will only the lottery it frequently is; be required by the distributor Suppliers of PROMs may offer

programming facilities, but it

Much consideration

should be given to the

various modiu avail-

suitability to the par-

· long run this may work ou

hus consideration whould be given to alternative media miable even when this entails The three most important wa currently available are Massette deck, the Hoppy disc adde programmable read only money. Also worth consideramare paper tape, though now declining in most fields, and

mmunication systems.

horizon for packaged software

to the point where virtually any

computer user can distribute software, if he so desires.

Much consideration should be

given to the various media

vailable and their suitability to

the particular product; after all,

wouldn't serve Mouton

othschild from a milk bottle;

conversely, you wouldn't sell

emonade in crystal decanters.

The prime question a potentia

distributor should ask himself is

Who am I aiming at?" This will

cover such factors as home/

capital investment and perfor-

The answer to this fundamen-

tem unsaleable product.

sch as viewdate and computer Cassette based systems have a wide user base in the personal computing sector of the market. hey have the distinct advanlage of being cheap and widely available, and the cassettes themselves are generally robust.

However, cost advantages must be offset against reliability

While they are reasonably efficient for handling of sequenandom access is required. Error m, although sophisticated interfacing techniques may inprove this. The capacity of a cassette depends on the leight of the tape, ie C30, C60, RC and on the recording tandard employed. Typically, it mages from 10K to 100K on a Flommy as

Useful techniques Packaged software in per- tribution medium should be sonal computing has ex- taken very seriously and panded to such a stage consideration should be hat virtually any com- given to alternative media KEVIN CRUMBALL and

puter user can distribute available, even when this software. In this article entails capital investment. Crumball and Jones go on

BOB JONES, both of whom to describe the various are systems programmers at media currently available to Micro Focus, consider the the user and discuss, in commonly used techniques depth, their particular adfor software distribution in vantages and disadvanthe broad spectrum of the tages, in relation to the micro market. They write requirements of particular that the selection of dis- sections of the market.

the tester only to be caught by patch on his own system, bu the irate user. When the fix rethis method is not usually appli quired is found, it may be pro-2 Exchange media. This can vided either by the user himself

he done by returning the oror the distributor. iginal media for re-In the latter case some form of programming or by supplying a pricing must be applied. This blank which the distributor pro-grams. This works for all the may be included in the original purchase prices or as a maintemedia considered and is esnance agreement. pecially cost-effective for fast Once a correction to a bug has been found, there is still the

affected users. This can be done in three stages: l issue a patch. This will usually be in the form of a written notice accompanied by a

3 New releases of software. problem of distribution among These are not generally done for bugs alone, unless they are crucial. They may also incorporate software enhancements or modifications forced by legislation, eg VAT and tax rates, etc. listing. The user then enters the



non-standard devices may be

used in a system, one of the

other solutions may be appro-

priate. The decision taken at this

point may make it necessary to

revise the decisions as to media.

The two should thus be seen in

conjunction with each other and

additionally with the question of

There are two main classes of

softward maintenance: bug cor-

rection and product updates.

Bugs will always occur in soft-

ware and this should be taken

For the bulk of applications, bugs will slip through the net of

into account when pricing.

product maintenance.

The MK14 National Semiconductor Scamp based Microcomputer Kit gives you the power end perform of a professional keyboard-addressable unit - for less than half the normal price. It has a specification that makes it perfect for the engineer who needs to keep up to date with digital systems or for use in school science departments. It's ideal for hobbylats and amateur electronics

enthusiasts, too. But the MK14 isn't just a training aid. it sbeen designed for practical performa so you can use it as a working compone of, even the heart of, larger electronic

MK14 Specification

★ 512 x 8 Prom, containing mon

The above plus some internal

details allowing modifications or

enhancements to be made; 3 Full

documentation including source

tion is the easiest to administer,

and it is also the cheapest to the

commonly adopted. However,

The first and lowest level op-

★ 4MHz crystal is becoming apparent that the current low volume of traffic will increase, especially at the international level. This will lines and I/O ports

The problems of charging

Paper tape, contrary to popu-lar belief, is still in fairly widespread use and affords a cheap method of data entry to almost any system. Furthermore, source programs can be distributed at very low cost without the need for a computer

systems and equipment.

\* Hexadecimal keyboard \* 8-digit, 7-segment LED display

program and interface instructions \* 256 bytes of RAM

★ 5V stabiliser \* Single 6V power aupply \* Space available for extra 256 byte RAM and 16 port I/O Edge connector access to all data

> Free Manual Every MK14 Microcomputer kit includes a free Training Manual. It contains



operational instructions and examples for training applications, and numerous programs including math routines (square root, etc) digital alarm clock, moon landing games, self-replication, general purpose sequencing, etc.

(5)

(2)

0

(2)

Designed for fast, easy assembly Each 31-piece kil includes everything you need to make a full-scale working microprocessor, from 14 chips, a 4-part keyboard, display interface domponents, to PCB, switch and fixings. Further software packages, including serial interface and cassette, are available, and are regularly supplemented The MK14 can be assembled by anyong.

with a fine-tip soldering iron and a few hours' spare time, using the illustrated . Tomorrow's technology - today!

within the next five years ... there will be Phil Pittman, Wireless World, Nov. 1977

microprocessor is already being used to replace other forms of digital, analogue, lectro-mechanical, even purely mechanical forms of control systems The Science of Cambridge MK14 Standard

The low-cost computing power of the

Microcomputer Kit allows you toleammore about this exciting and rapidly advancing area of technology. It allows you to use your own microcomputer in practical applications of your own design. And it allows you to do it at a traction of the price you'd have to pay elsewhere. Getting your MK14 Kit is easy, Just fill in

the coupon below, and post it to us today. with a cheque or PO made payable to Science of Cambridge And, of course, it. comes to you with a comprehensive guarantee. If for any reason, you're not completely satisfied with your MK14, réturn it to us within 14 days for a full cash refund. Science of Cambridge Ltd.

6 Kings Parade, Cambridge, Cambe., CB2 ISN, Telephone: Cambridge (0223) 311488

To Science of Cambridge Ltd., 6 Kings Perade, Cambridge, Cambs, CB21SN. Science of Cambridge Addréss (please print) Please send the an MK14 Standard Microcomputer Kit, I enclose chaque Money orde/IPO for £43:55 (£39 95 The state of the s + 8% VAT and 40p p&p)

Because DP is a service function, it depends on its users for ultimate success. But users from the Board to the shop floor differ in needs and outlooks and as they grow in power and numbers their attitudes can make or break the fortunes of DP.

This practical workshop, to be run by Nigel Laurie of Communications Audit, will help delegates to discover the techniques and approaches that work best in helping to manage successful user relations. The workshop is practical and based but participative so that delegates can put theory into practice. A summary of a survey conducted at a previous Nigel Laurie workshop on this subject was published in Computer Weekly on ience. Above all it ig

For this latest workshop this number of participants will be limited in order that the maximum benefit may be a place filease complete the Application form and return it to the address shown NOT to Computer Weekly out he IDPM

## COMPUTER WEEKLY/IDPM WORKSHOP

Computer Weekly in association with the Institute of Data Processing Management present

## Successful User Relations

A PRACTICAL WORKSHOP ON EFFECTIVE COMMUNICATION BETWEEN THE DATA PROCESSING DEPARTMENT AND THE USERS

Tuesday, October 17, 1978, at the Holiday Inn, London

Tor Conference Administrator.

IPC Business and Industrial Training Surrey House, (Throwley Way Surton, Surrey SW1 400 Telephone: 01.843 8040

for the Successful User Relations Workshop to be held at the Holldey Inn. George Street London on Tuesday, October 1

The fee is 650 plus VAT 64 for enembers of the IDPM it is 645 plus VAT 83,80 This covers strandance at the workshop.

地。但是在中国的一个人

Are your member of the (DPM?

languages aiready, and pointed to the fact that Basic was now

was of little relevance.
Within all this euphoria, however, there lies the realisation that such potentially explosive growth in a new market for software products will almost

well established in personal usually have a one-to-one relationship with a computer system at this level, the fact that Basic is an inefficient language

nevitably attract some "cow-

Several companies within the industry said that there is already a need for some form of sation to be laid down if software packages are to be

to purchase chips from a retail shop, place them anywhere

Added to this is the distinct tions, but recent developm probability that the more comindicate two possible conmon applications packages will tenders. Following its move into also be available in this form. the market with Apple II sys-The main hindrance against tems, the announcement by ITT this has so far been the fact that that it is to manufacture the hardware under licence is a clear indication of the company's in-

most microprocessors do not operate using position independent code, so that memory boards holding applications irmware are a complex engineering task. But recent additions to the roster of available devices, such as Intel's 8086 and Motorola's 6809, do work in such

## within reason on a printed The "name" will circuit board, and build a system from one of these **Beyond home** and hobbyist

10% to 30%, giving a 1980 market value that should lie somewhere between £4 million and £11 mil-

As for the genuine hobbyist and home user, who buys a personal computer for personal edification, aggrandisement, entertainment, or pure swank, they take only a small share of the total market. The highest estimate for 1978, is 30% of the total market, while

the lowest is around the 5%

mark. The average estimate, at 18% of the total market, puts a

1978 total value on the sector of only 2823,000 of the total market.

Ry1980, the percentage share will drop below even this figure, so the industry thinks. The up to an average estimated average estimate is 10.83% of the total market, and while one estimate suggested a 20% share for hobbyists, others put the share as low as 5%. This gives a promotion is that some £2 millions as low as 5%. This gives a promotion is that some £2 millions as low as 5%. This gives a promotion is that some £2 millions as low as 5%. This gives a promotion is that sector.

estimate being slightly down, at £2 million and £7.5 million.

18.33%. The degree of variance reduced slightly, to rest between vey, the purposely undefined pository of all the purchasers and applications the industry has encountered that did not fit neatly into one of the more specific categories.

> Into this catch-penny slot, however, the sample surveyed placed a total of nearly £250,000 worth of business as the estimate for this year, the average estimate of the total market being 4.5%. While the lowest share attributed to it for this year was zero, some suggested that it could take as much as 10%

ticular product; after all you wouldn't serve Mouton Rothschild from a milk bottle. more expensive. In either case, PROMs are an expensive way of distributing

software since they cost about 64 per K byte, plus programming and installation costs. Telecommunication systems are a relatively new and unproven method of distributing soft ware to a wide market. However, with the dramatic fall in modems and interfacing costs it

open an International market place for any network user. have yet to be resolved, hence no realistic comparison as yet will be well advised to keep abreast of developments in

step-by-step instructions provided: li is noi unreasonable to assume that i hardly any companies engaged in electropics that are not using microprocessors in one area or another."

interesting vacancies, in the long run the present situation could be damaging both to employee and employer.

In this article, ALAN BEN-

ness, as it offers a large pool of

Association, analyses the problems and provides some practical suggestions for improving and stabilising the job market.

RECENTLY, I have been in discussions with CSA member cussions with CSA member companies and some of their employees about the difficult situation which now exists as a result of the staff shortage. As always, there are two sides to any story, and since the chaotic state of the job market in comstate of the job market in computing, in my view, helps no one in the long run, I shall try to persuade readers that now is a time for both employers and employees to stop and think should label to stop and think

entrepreneurial activity.

mprove their position in life.

Faced as he, or she, is with in-

flation, high taxation and until

very recently with an economy

above all running out of hope, it

is not surprising that employees seek salary increases with great

energy. The social legislation which has come on to the

statute book has created an en-

vironment for shortages of skills

Many factors are

conspiring to make conditions for

seeking and finding

computing staff ex-

tremely difficult, if

Again, the employee in com-

eer paths either in his own sector

of operations or in a recognition

of his skills by general manage-

ment. This is much less true in

the computing services industry, which has developed these con-

ditions, and is one reason why a

period of employment in the

By and large computing

employees do not enjoy excessive fringe benefits, receiving

much the same by way of com-

pensation packages, as employees in other industries.

On the other hand he is in de-

mand and, faced with an

employer who abides by the pay

policy, compares the 10% in-

time scale. Or alternatively

large systems experience has

services sector is so attractive.

ing cannot yet see clear car-

not impossible.

to be exploited.

Many factors are conspiring to make conditions for seeking and finding computing staff ex-tremely difficult, if not impossible. Firstly, the education and training system failed lament-ably to invest in data processing courses, methods and techniques per se and as part of other

Worst in this area of failure was the neglect in producing qualified people to teach the application of computing. The result of this has been that the pool of people entering the industry has been too small and there is still widespread misunderstanding.

Then the computing industry, with some exceptions, failed to create and maintain formal intake programmes of graduate, professional and school-leaving personnel. Therefore no momentum was created for a constant stream of people to cnter the industry. This was compounded by the 1971 recession when computing companies at best stopped recruiting, and at worst laid off (albeit small) numbers of employees. This interrupted the small flow of entrants to the

Since 1972 there has been a sustained growth of computing by users and in the services in lustry. This was spurred on after 1973 with the availability of lower cost minis and again by developments in data com-

munications., Competition for staff — especially skilled and experienced staff – grew in intensity, and the activities of the specialist recruitment companies, which were able to present job opportunities so much more effectively, increased the demand. Finally, as with any skill shortage, the pay policy with its rigorous criteria for increases ensured that the only way for many computer staff to gain useful increases in salary was to

This condition is still with us loday. So are the requirements of the Price Commission with regard to the admissibility of pay increases to sustain increases in

In short, conditions could not have been designed better to produce a shortage of skills, competition for those skills and crease in pay (6% after tax) with up to 25% which he may get by responding to the advertised offers for Jobs which he apparently dan fill. the constraints upon computing utilisation and growth that this shortage now imposes. And imposes at a time when Britain is Well there are some other considerations. His reputation is built at least in part on his someown in a confevence of a curriculum vitae which revenis three or four jobs in savi two years supposts that poised for its biggest leap for wird in the technology for years of with profound implications for the economy and the testrat-turing of the manufacturing in say two years suggests that the owner has not had time to deliver proven work over any process because of the microprocessor revolution.

There is always a moment when, in the headlong rush for growth and development, it is not been completed. Or that there has been no time for ber-formance evaluation and job wise to pause and ask questions about the means as well as the ends. In the case we are discussponisal leading to promotion.
These are noticeable gaps and a careful employer will observe sing the constant circulation of skilled and expedienced staff

killed and experienced steff careful employer will observe the prings only lasting benefits to these factors.

Pay increases achieved by from contributing to the pro-Bi gress of the organisation for whother their recipient with which one works, as well as the cause their recipient with which one works, as well as the cause?

Before looking at both sides of the organisation for who works, as well as the cause of the organisation for which one works, as well as the cause of the organisation for which organisation are the cause of the organisation for which organisation are the cause of the organisation of the cause of the organisat

# stabilising the job market

is a necessary condition for growth, technology transfer and

Taking the employee's view-point first, I readily accept and If all computing employees were to remain with an organencourage anyone's right to isation for three years - an impossible and perhaps an undesirable condition — the skill shortage would transpose itself into a manpower shortage which, with the right entry policies, could be solved within a The employee should also

consider the non-salary conditions which apply to his job and examine very closely the comparative conditions which are attached to a job-hop salary increase. Is the pension contribu-tory? Is it indexed? What are the health and medical insurances and are they as comprehensive? What about holidays, working conditions, promotion and the project beyond the one for which his services are sought?

he identify how his organisational position will align itself with

style or expectation? erable thought to these matters, but I have seen evidence that many do not. And many people move without a preliminary discussion with their present management about their changing needs. I have found that where this does happen (in-evitably in the better managed

appointments, changing respon-sibilities, travel or often just better communications, can often preserve the one thing which must in some measure benefit both parties, and that is

puting people are loval to their profession and not their employer. This reaches the extreme in the US where large

current employer.

care not to price himself out of

the market; if he becomes too

Now, from the employer's

viewpoint, simply to reverse the

coin on the above discussion is

not enough. It is a genuinely

complex task to cope

managerially with a burgeoning

industry which embraces

technology with a high rate of

challenge and a critical shortage

of skills. It is only now that sen-

for management in the com-

puting services industry has

enough experience to begin to

develop techniques of com-

munications which will enhance

the stability of the labour

A curriculum vitae.

which reveals three

or four jobs in say

two years, suggests

that the owner has

not had time to de-

liver proven work

over any timescale."

reached an age and has earned

pensive his yield will drop.

which might be asked more often is, "Will this be a better company if I stay?" Sometimes people, both employers and managers as well as employees, need to surmount career thresholds and personal hurdles which appear from time to time and staying may provide answers which are as successful A last thought for the employee is that he should take

Some thought should be given by the employee who contemlates a move, to promotion and organisational comfort. An objective analysis of his chievements in his present job useful. Are they identifiable and can they be referenced? Is he comfortable organisationally? That is, are his respon-sibilities, both for projects or people, within his range of experience and competence and is he stretched? In any move, can

I am sure that many people to move jobs do give considcompanies) ways and means are

found for needs to be satisfied.
Combinations of new

Managing computing Which brings me to another well educated, positive and old fashloned word; loyalty We young, in a social environment hear so much today that com-where participation, consultating people are loyal to their tion and decision sharing are the profession, and not their mores to any discussion, should fessionals, who are articulate, profession and not their props to any discussion are the profession and not their props to any discussion, about employer. This reaches the aximployment, has ago proved easy. Indeed, despite this, the company loses to a competitor, component on some computing sarwice the entire resource, people, need to give example and to company A and loins company a puritan view of things and machines everything leaves maintain financial stability take company A and joins company a puritan view of things and what happens when the considered out work on revenue hearning properties which is considered at threshold in their growth as ordinary copiers which is proving employee asks why need to communicate with collections of the constant of the communicate with collections of the constant of the constan

promotions and completed project references are a sound pany. But if he does, do you recruitment, then it must be respond? How can you demonworthwhile finding those issues strate this quality? One way is continuity of employment, turnover with all the disruption riding with the company which ensues, and concenthrough good and bad times, and trating management attention if you are keen to move for the best of reasons, then do so from

JAMIN (pictured right), director-

general of the computing Services

If we take pay policy as one a standpoint which includes the difficult area, it is clear that CSA convenience, or at least the members, for example, prefer to minimum disturbance to, your honour the national commit-Finally, another question tractual performance for ment. The difficulties of concontracts, added to Price Commission requirements, are just two reasons. Many see the need, however, for some cost restraint and, therefore, pay restraint, in sheer marketing terms.

Employers faced with recruiting new employees, whose skills are no better than existing employees but whose salary demands are much higher, face an almost impossible problem. Perhaps more systems of results-based remuneration or profit sharing should operate. The dangers of this approach are well known and the interdependence of employees in the computing industry is as marked as else-

There is merit, llowever, in strengthening communications with employees, about the value of other benefits, about organisational strategy and about company objectives, etc. so that pay becomes one of only a mber of factors governing the employer/employee relation-

Employers who take visible steps to recruit "at the bottom" that is to bring in trainees and grow them, usually command more respect from existing employees. One CSA member, a ... It is a difficult balance to small software house, takes one ... right, but it is worth the try.

graduate a year from his local polytechnic, and it is one of the most sought after jobs, according to the local head of department. This year, he will take two and, in the five years since he started, all the graduates are still there, with two of them in management jobs.

Communications is the most mportant factor in my view which concerns the stabilising of the computing job market. Stabilising does not mean kind of mobility which takes place is healthy, reasoned and above all is not one-dimensional. For this to happen, communica-tions must be good with employees, with government in elation to policies which affect companies, and with colleagues. for example with fellow CSA members, so that common problems and approaches can be

This is not the place for a discussion on techniques of communications but only a place to emphasise to employers in the computing industry that if they succeed with communications they will almost certainly succeed with all else.

It is time to stop and think about jobs in computing, time for people to pause and think about whether the frenzied movement taking place at the noment cannot be calmed to a combination of higher productivity and improved com munications. Changing one's ob for the best reasons will contribute to growth, also building new entrants will contribute to growth and growth to employment, profits and more opportunities.

It is a difficult balance to get

# Intelligent copiers

laser or optically from the face

ne way as an ordinary office copler works. The light changes the electrostatic charge on the drum, black powder or "toner" is picked up by the charge and the toner is then transferred to the

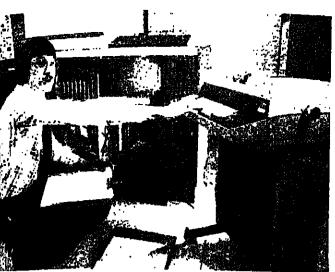
paper. Printing this way is much faster than the current impact printers: 30 coples can be made per minute. A wide range of type faces can be held in ROM, all of

Aprox will say very little some graphics capability.

Charts, and graphs can be drawn on the screen — which is in ger than most WP screens now; walng a joystick. The printer can then reproduce these along with any text desired. without difficulty.
The Workstalion writes the

information on to the drum with a laser; the Wang and Toshiba machines draw the characters on the face of a CRT, from where it is transferred to the drum by a bundle of optical fibres. The principle is the same as that used by IBM's laser printer, but the machines are much slower, and

Another advantage of the in-telligent copier is that it can be used as a type of facsimile receiver since the electrical signal cat come from as far away as one likes



## Final test on first system

ITT 6100 ADX message awitching system to leave ITT Business Systems Group's Borehamwood factory.

Costing up to £26,000 for a

typical system (and less for a simpler one), the 6100 ADX is the w-cost successor to the 600 nd 6400 ADXs.

Launched at Co 78, it uses intel 8080 microsors to store and forward messages between as many as 64 lessed lines and 16 dialled telex

Messages are togged, and can be checked and rerouted via a VDU. Receive and transmit can take place at different speeds, with messages held on certridge disc while awaiting transmission. disc while awaiting transmission cally rediatled.

The company says that low cost is achieved through volume production and use of LSI tech-

## **Electronic money** council set up in US

IN an effort to promote public inderstanding of Electronic funds Transfer, and to overcome consumer resistance, a group of US financial instituions has set up the Electronic loney Council. The council has carried out a study of consumer ititudes and is launching a publicity campaign about EFT.
The future of EFT in the US is

in considerable doubt. Sales of wtomated cushiers and related ipment have been lower than recast, but bankers and manufacturers seem on the while to be optimistic, certainly mare so than in the UK, where a fecent report said that EFT would not come nearly as quickly as had been predicted (CW, June 1).

romoters of EFT in the US el that consumer resistance and the scepticism of bunkers ethe main obstacles to growth of EFT; hence the promotion ampaign. The Council's study ound that fewer than half of <sup>bose</sup> interviewed had ever heard of EFT, but of those imiliar with it only 24 per cent

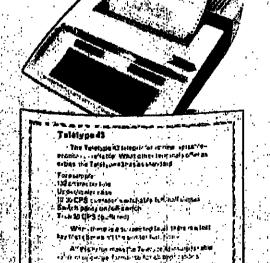
The Electronic Money Counalso wants to prevent EFT from being over-regulated by cent were undecided.

the government. To this end it has produced a code of conduct. for service providers which it calls the Consumer Bill of Rights, in an effort to pre-empt

Herb Wegner, co-chairman of the Council and president of Credit Union National Association, explained, "We have no illusions that public attitudes can be changed quickly. Some consumer activists, legislators, and opinion leaders will remain sceptical, at best. Our objective is a fair and balanced treatment in the Press, in government, and in the minds of consumers. Specifically, we seek to prevent EFT from being over-regulated before the public has the oppor-

tunity to appraise it fairly Of the opponents of EFT found by the survey, the largest number, 19 per cent, objected because of fear of error. Close behind, 17 per cent were afraid that the added convenience of EFT would encourage overspending. Overall, of those questioned, after EFT had been explained to them, 33 per cent thought it should be encouraged, 32 per cent thought it should be prohibited, and 35 per

## Communication that's kind to your pocket



Prat & a medie abarraka Pelanga 401/8 11

Tolegration Equipment of a second GRDC List for Statement States, The product of

#### '50% of revenues from software' by 1988 COMPUTER WEEKLY, August 24, 1978

conference, computer industry investment

In his paper on IBM and the threat from been heard. olug compatible suppliers, Easterbrook predicts that IBM will unbundle its systems software charges and also modularise its systems software to a much greater extent in order to make it harder for PCMs to stay price competitive with IBM and to copy changes made by the industry leader.

Easterbrook also sees IBM modularising Burroughs Attached Fortran Processor). microcode.

from software products will increase from 3 monitations, as well as central processing.

an independent manufacturer between six monitations, as well as central processing. One of the advantages to IBM of adopting months and two years to produce a dupliover the next ten years, according to one of this approach, according to Easterbrook, tate of each new IBM microcode module the speakers at the forthcoming infotech will be that it will make anti-trust actions after its announcement by IBM. The first taken by PCMs against IBM even more

This was underlined recently by the Memorex case, where the judge ruled in favour of IBM after the jury had failed to as a year. come to a unanimous verdict, and asserted that the case was far too complicated for a jury to understand.

Looking at one of IBM's most powerful weapons against the plug compatible CPU hardware to a much greater extent, pro-manufacturers, microcode, Easterbrook ducing individual hardware/systems software/microcode packages dedicated to introduction of separately priced modules of functions such as language processing (like its operating software implemented in

complex than the cases that have already tion would not take place for three months to a year after its announcement and the time taken after that to copy the product would be at least three months and as much

Easterbrook concludes that IBM's policies of unbundling software and modularising hardware and software will help to maintain its profit growth and constrain PCMs over the longer term. He predicts that some PCMs will survive and a few may thrive, depending on their ability to become independent of iBM software and their agility in maintaining interface compatibility with

# Repeat performance of 'IBM-the next five years'

In his paper on IBM's network-

ans. Howard Frank, president

of the Network Analysis Corp,

will consider how IBM's net

working concepts, in particular

Systems Network Architecture,

SNA, will be extended or

Possible areas of confronta-

modified.

conference "IBM — the next five years" in March, the organisers, Infotech, are staging a repeat the top end machines in the performance from September existing IBM 370 series.

As in March, the subject matwill cover most aspects of BM's activities, present and future, but most of the speakers will be different and the London venue has also been changed from the Connaught Rooms to the Greenwood Theatre, SE1.

The conference opens on the morning of September 11 with a session presented by Ulric Well, specialising in market evaluation and competitive systems analysis. Well is now in charge of EDP market analysis at Mor-

#### Tutorial on SNA, packet switching

THE three-day conference a the Greenwood Theatre costs £310, and for another £160 dedays to take part in a tutorial on SNA and packet switching. This will be led by Howard Frank of the Natwork Analysis Corp. who is also presenting a formal paper on the subject on the third

day of the conference.
On September 14, Dr Frank
will start by describing the
various types of natwork that exist today — centralised, dis-ributed and hierarchical — and the equipment used in them like controllers, concentrators and

controllers, concentrators and packet switches. He will then talk about network protocols and lead from this into a description of BNA.

The subject matter on day two will include the structure of packet switched networks today and a look at new application areas and trends. The tutorial will end with a discussion of distributed processing, electronic mail and the office of

trends in the cost of current and which are now moving into rich

mainframe series from IBM will paper on IBM's shifting revenue be the subject of a paper to be sources; presented at the conference by The third day of the conBill O'Connell; senior vice- ference includes sessions on

keting at Amdahi Corp, the firm that offers direct alternatives to

Another firm that challenges IBM head on in its own marketplace, Memorex, will be represented at the conference by O'Brien, marketing manager for the firm's large storage systems group. O'Brien will look at possible future peripheral systems from IBM. including new storage and I/O

Another threat to IBM's huge base of mainframe computers distributed processing - and the ways in which IBM is trying to eliminate the main rational for it by promoting low cost satellite data communications, satellite Business Systems by

Howard Anderson of the Yankee Group.
The second day of the conference starts with two papers on software matters - systems

oftware and databases Dick Bayles, of National CSS, the big US-based time-sharing bureau, will talk about the extension of IBM's software unoundling into systems software and the migration of systems functions into firmware and ardware. He will also consider the effects of these trends on future IBM architectures and on the manufacturers of IBM

compatible processors.
Stephen Robinson, president of S L Robinson and Associates, a US firm that specialises in consultancy and educational services relating to databases, will discuss the likelihood of IBM adopting a database architecture base on the ANSI and Codasyl proposals and involving a "back end" database machine.

Returning to the plug com-patible challenge to IBM, Bill esterbrook, of the US investment banking firm Kidder Pea-body & Co, will list the powerful battery of economic weapons that IBM can use against the

Conflicts within IBM itself. gen Stanley, a prominent New between the mainframe York investment and market manufacturing Data Processing analysis company. He will dis- Division, regarded as the heart cuss and diagnose the economic of IBM, and the shortly to be state of IBM and its competitors imerged Office Products and in the near future, and evaluate General Systems Divisions. new markets, will be discussed orthcoming technologies new markets, will be discussed.

The forthcoming E and H, by consultant Phil Dorn, in a

#### Swansea returns to work

THE issue of driving licences and vehicle registration document from the Swansea Driving and Vahicle Licensing Contro resumed last week following the return to normal working by maintenance iast week tonowing the return to indinar working by maintenance engineers who were refusing to service the centre's air conditioning system. The action shut down the three ICL, System 4s at the centre system. The action shut down the three ICL, System 4s at the centre for two weeks, and was in adport of a pay claim by government blue.

in Europe, and the user view of IBM, and rounds off with a forum in which the speakers will topics of the paper on IBM i answer questions from the floor. Europe, to be presented by David Butler, of Butler Cox and ing and data communications IBM's pricing, support and

maintenance policies and their effects on users will be looked at Alan Duncan, the technical adviser to the management service division of Barclays Bank one of the largest IBM users in

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# APPOINTMENTS IN IRELAND



# Eire needs to attract home its expatriates

to realise the importance of fluence on their everyday lives Earlier this year. Time the industry, the most conmagazine included a 15- straining factor on the use page feature to explain the of computers is the background of what is now avullability of computer the most advanced and personnel. This was true at fastest-growing industry in the world, and to indicate the impact which we can expect recent developments will have on our normal

clusion of microcomputers.
The key to the application of this computational power is the development of software or the programs and

levels, you need skilled personnel; not just people with a strong scientific or generated by the continued market bias but also with an export beautiful bias but also with an export bias. mathematical bias, but also people with logical minds and a keen interest in problem solving.

Immediate vacancies exist for:

THE PERSON

THE JOB

THE JOB

THE PERSON

THE JOB

technological breakthroughs and developments on the "hardware" side of

But some of the more en-lightened countries have virtually no exposure to use of computers and sion is made to implement a day-to-day lives. Even the pocket calculator has now been enhanced by the inboth at first and second day-to-day lives. Even the started to take significant scently that, in a limited both at first and second date is generally continent by at least two to "yesterday". Here again the level education aware of second level student has three years. We are cur-turnkey solution tends to be computers and the com- had an opportunity to rently experiencing a high favoured, hence an inputer industry. 2 Gear appreciate the computer rate of growth and in addi- creasing demand on comthemselves at third level and its potential and to ducation to produce a sub-realise that there is such a the establishment of puter consultants and softinstructions needed to stantial number of gradu- thing as a computer in- specialist software houses, ware houses to provide high make computers intelligent. ates in computer or related dustry in Ireland. To develop software at all sciences, to help meet the At third level, our in velopment grants, both to puter specialists to speedily

Dataproducts (Dublin) Limited, set up in 1965, presently employs 400 people at its Coolock facility — engaged in the design, manufacture and assembly of memory systems and line

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o cate, date svallable, to:

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Fieldphonel 311686

continuing To help meet the need for more skilled computer staff, of which there is an acute shortage at present, PAT RAFTER, managing director of Insight Marketing and Personnel Consultants, Dublin, gives here an overview of the computer industry in Ireland. Rafter has been in the computer business for 19 years and has covered most aspects of the industry from both the beginning, nearly 20 sides, manufacturers as well as users. He is also years ago, and it is still true a member of the Irish Computer Society.

growth in the use of com- are limited and the qualified output annually from our

**Dataproducts** 

other units within the pub-

the progress of many of the successful consultant their development pro- needs to have an in-depth grams has been hindered by the shortage of suitable knowledge of the industry to enable him to correctly personnel.

Where there is a time and to communicate with constraint on an urgent and accurately assess, project, this has led them to potential candidates and look for the "packaged" or turnkey" solution.

In the private or com-

implement a wide variety of

As many of these projects The public services and have been cost justified on In Ireland, things have moved far too slowly. A short of demand.

Colleges clearly falls far lic sector are committed to developing their own combenefits which will acrue imescale is of the essence and the cost of the personnel involved tends to be a esser consideration.

As a result, everyone requires experienced staff with a proven track record which will enable their employers to put them to productive use as quickly as possible. Because of the limited resource in this country, this frequently results in a frantic search for suitable personnel ending in "head hunting" Though there is no ideal or immediate solution to this dilemma, two avenues of approach immediately

ome to mind. Firstly, in spite of budget and manpower constraints. computer users and suppliers should allocate a percentage of their budget to a trainee program at either school leaver level or graduate level to go some way towards providing a source of trained personnel

Secondly, efforts should be made to attract expatriates from UK and overseas back to this country, thus going some way towards meeting the curent need for trained per-

Viewed from a number of management, positions which I have held in the industry it has been clear to me that the recruitment of whether they are fulfilling a marketing or a technical



RAFTER . . . . "in Ireland things have moved far too

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Starting salary willba related to qualifications and After two years' satisfactory service an allowence of E333.00 per annum is payable.

reference SB 280778/CW, to the Civil Service Com sion, Rosepark House, Newtownerds Road, Belfast 8T4 3NR (telephone Dundoneld 4585 ext. 256). Completed forms must be returned to arrive not later than 7th

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DATA PROCESSING MANAGER
string Managher will installly when Ecopely with the properties of a pint or the training of a pint of the training of a pint of the training of a pint of the training of training of the t

PROGRAMMER/ANALYST

Programmer/Analysis (au work on dear of the Idean reported in the Conversion and enforcements)

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A begree or appropriate professional qualification is desirable. Suitably qualified disabled persons will be considered application forms from the Chief Constable, Force Headquarters, Ripley, Derbyshire, to be returned by 8th application, 1978.

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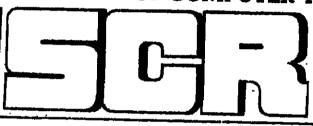
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Candidates must be able to take outline specifications prepared by a Systems Analyst and cerry out detailed dosign, coding, and testing of programmes. A minimum of 4 years Cobol experience and at least one year's analysis in a 370

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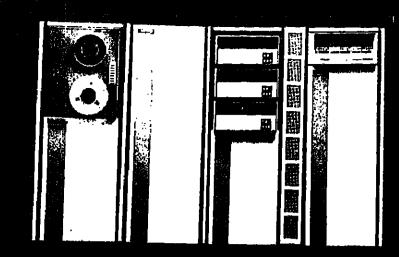


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Systems

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Modular Computer Services MODCOMP to the people in the know recently introduced an important new member to its established series of mini computers. The launch of 'Classic' will not only consolidate the company's position with existing industrial, data communication, scientific and engineering industrial. the company's position with existing industrial, data communication, scientific and engineering applications, it will also open up now markets for the wide range of MODCOMP mini computer products. This major product launch will obviously expand the company's operations throughout the UK and Continental Europe and the personnel we are now looking for, listed below, represent the buginning of a major recruitment

COVENTRY SALES ENGINEER: to #8,000 basic p.a.. + commission

Dynamic sales origined needed to work from our Coventry office and cover a wide area in the UK. Essentially the person will already have a proven background of successful selling within a minicomputer environment. Should proferably have a knowledge of process control, scientific and engineering markets and be capable of the kind of drive and determination that will care you £5. £6k commission above targets met.

COVENTRY SYSTEMS SOFTWARE SUPPORT UK: to £6.500 p.a., plus car

A rewarding job for someone who enjoys getting to grips with complex software problems and who can discuss them with users and engineers. Must have a background of Assembler working on operating systems and systems software, preferably in real-time communications, mainframe or mini. Travel within the UK is obviously involved.

#MODCOMP Computer Classics

WOKINGHAM SYSTEMS SOFTWARE SUPPORT EUROPE: to £9,000 p.a.

A similar position to that in Coventry but also offering the A similar position to that in Coventry but also differing the opportunity to travel throughout Europe providing technical software, support to a wide range of MQDCOMP users. It additionally demands to ordination of information between the various regions and the Jevelopment group in the United States.

WORINGHAM SENIOR ANALYST PROGRAMMER: to £6,500 p.a.

MODCOMP'S "in-house" functions will include accounting, order processing, production control, etc. This will need a first class COBOL programmer who enjoys being involved from design through to implementation. The person will probably work well alone and a background of commercial programming on minis is proferable, though not essential. An understanding of financial applications is also important us is an ability to take on the responsibility for implementation.

MODCOMP offers excellent company benefits and good salaries. Benefits include free BUPA coverage and non-contributory pension, excellent working conditions and the opportunity for personal success as MODCOMP grows. Relocation expenses will be considered.

For full details on any of the appointments, contact Anne Campbell on Wokingham (0734) 781179 - or send Aane a resumee to :

Modular Computer Services Inc.

# Operational Systems Development Supervisor

Our client is part of a major British engineering company with manufacturing units throughout the UK. Due to recent expension and modernisation programmes a number of vacancies, have arisen and currently they are seeking an Operational Systems Development Supervisor to be located in

The ideal candidate, aducated to degree level, will have a minimum of three years experience in systems development with one year at supervisory level, and a working knowledge of NCR hardware. Programme languages should include NEAT and a knowledge of COBOL will be an advantage.

On appointment the responsibilities will include personal involvement in analysis and programming, the supervision of analyst programmers and the maintenance and development of existing systems. In addition the Supervisor will be responsible for the implementation of new systems which have been developed at a central site and relate to IBM main frame and mini-

You will be working within a challenging menufacturing environment which will demand initiative and enthusiasm.

Conditions of employment are excellent and include a competitive salary, contributory pension scheme and participation in the company car lease scheme. Relocation assistance will also be available where applicable.

Male or female candidates should write giving full but concise datalls of age, qualifications, career history and salary progression to date. State the name of any organisation to whom your letter may not be sant and address your application to: Mr R D Taylor, Regional Manager.

## Whites

Phoenix House, 45 Cross Street, Manchester, M2 4JF Offices: Bristol, Glasgow, Leeds, London and Wolverhampton.

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# SYSTEMS ANALYST PROGRAMMER

Application forms may be obtained from the Assistant Director of Manpower Services, 21 Bordon Street, Blasgow, 81 3PS, (Tel: 041-221 4275) to whom completed forms should be returned within 14 days of this advertisement appearing in the press. (Ref. G114).

STRATHCLYDE POLICE WORLD LEADERS IN COMMUNICATIONS



BELGIUM £20,000-£24,000 P.A.

#### PACKET SWITCHING SYSTEM DESIGNERS

Required initially for the system design phase of advanced packet switching networks utilising newly developed telecommunications had dware. The successful candidates for these positions will probably he in their early 30s educated to design standard be in their early 30s, educated to degree standard and will have a career background which includes substantial mini computer experience. Assembler and high level language programming systems analysis and deelgn on mini computer equipment in a real time telecommunication environment.

be responsible for the detailed design of such projects assigned to them and the provision of all

projects assigned to mem and the provision of all program specifications and instructions for the members of their project team.

Be self-motivated enjoying the prospect of working in charge of a small team with major project REF: DCO/010877

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Employment Business Section
Howard Organization International Limited
Selstree Way, Borehamwood, Herts, WD6 1LE
Tel: 01:935.4066

Management Information Centre Waltham Forest Precinct

#### Management **Systems Project** Leader P01/2

The Job
The North East London Polytechnic Measagement Information Centre at Weitham Forest is in the process of installing a 2803/30 with a 7502 Modular Ferminal Processor, and wish to appoint an experienced ensignt capable of spearheading further development of the data management system. The Project Leader will work with a small teem of programmers involved in determining the Polytechnic.

then details and application forms are available from the Personnal flow. North East London Polytechnic, 169 The Grove, Stratford, 218. chines: 688 6811 ext. 32, quoting reference no. A648,78. Closing a September 7th, 1878.

North East London Polytechnic

#### MYRIAD **OPERATIONS**

#### **OPERATIONS SUPERVISOR WEST OF LONDON**

£5500 + Bonus + Car

This is an excellent opportunity for a person with a sound background in IBM 370 computer operations, who now feels capable of assuming full responsibility for the production functions of

The company is the U.K. subsidiary of a European manufacturing concern with markets world-wide. Installed hardware comprises an IBM 370/138 mainframe, running under DOS/VS POWER, and a DEC PDP 11/70. At present a distributed processing network, based on a number of DEC machines, is being developed.

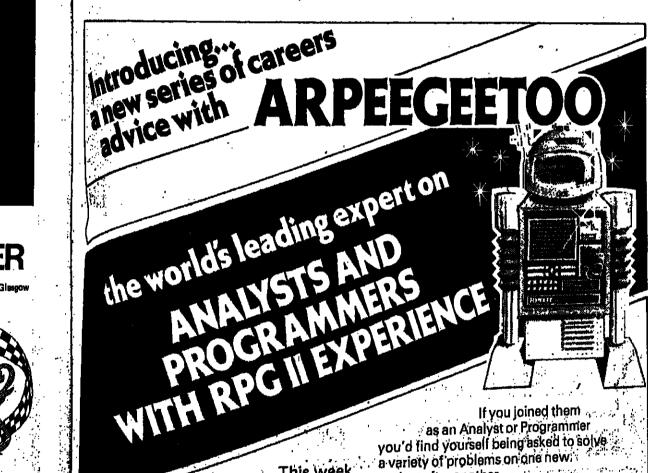
The person appointed will become responsible for twelve operating and control staff and should therefore have sound technical experience, coupled with proven supervisory ability.

Excellent opportunities exist for progression within the organisation which is currently enjoying excellent trading and is expanding its D.P. activities. The commencing salary is enhanced by first-class conditions of employment including a company car, and a twice yearly bonus which will be a minimum of 10% for the first year.

Ref. W2/2408

24-hour answering service Please telephone for a confidential discussion or write:

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This week Arpeegeetoo says 'Why confine your skills to one installation when you could work on hundreds'?

Don't you find that working for just one user soon ceases to challenge, your ability 7 个是是,我们还是是一个人们的

After all, once you've set up the system there's not much more to do than lwiddle the knobs and tie up the ends, lathere?

You could be using your skills on greater variety for much higher linancial rewards. Take the people down at Altergo Business Systems for

They're professionals in RPG II, work - they travel around developing and installing systems for various companies in different situations.

as an Analyst or Programmer you'd find yourself being asked to solve a variety of problems on one new: project after another.

They particularly need people with experience of IBM machines ranging /from System 32, 34 to System/3 Model 15D, and they're willing to pay very high salaries to get you if you've got ambition as well as ability.

Don't be surprised at that-Altergo is just about the most successful software group in this country. Business with them is so good, they can afford to make sure they find and keep. the right people.

If you want to travel far and wide. that's great. If you'd rather stay roughly where you are now, that's OK too.
Either way, there's always plenty of responsibility to be won.

Take my tip - contact Brian Walker, or Barry Whitesman quoting BS/13 on 01-734 9681 or efter

8.00 p.m. on 049481 2713. Altergo Business Systems Limited," Warwick House, 38 Soho Square, London W1V 5DP.

Programmers-Analysts... **Looking for** more money, A new challenge, a different application just a change of scenery? Here's the form

Just complete the coupon below; send it to us and you could be well on the way to a great new job. Or, if you prefer,

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and ask him for details of the varied and interesting jobs we have available.

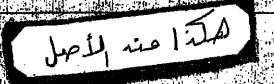
#### **Knight Computer Services Limited**

14 Old Park Lane, London WIY 4NL. Telephone: 01-491 4706. Please send me an application form:

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## Sales Minicomputers MIDDLE EAST

DATA GENERAL is a US based mine-computer company with over 10.000 employees worldwide, a turnover last fiscal year in excess of \$ 250 millions, a gross profit of 21% and New York stock exchange listed. Our growth rate is close to 50% annually.

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Send your CV to Jan Cederlund, DATA GENERAL EUROPE, 61, rue de Courcelles 75008 Paris. Do not forget to write your contact telephone number, where we can find you during office hours.

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Cray Research Incorporated, the U.S. manufacturer of the world's fastest computer - the CRAY-1, now needs more highly-skilled people to provide comprehensive Installation and service support in the U.K. Junior and Senior Engineers are required.

You should have a sound knowledge of electronics backed by a high mechanical aptitude,

Although eventually based in the Berkshire area, selected candidates will be given comprehensive training in the U.S.A. in their first six months: ... These posts carry good salaries directly linked to individual qualifi-

cations and experience —which will be supported by a good range of employee benefits.

So, if you're looking for the opporlunity to join a company during an exciting stage of its development, please write with full details to: Stuart Drayton, Chief Engineer, Cray Research Inc. James Glaisher House, Grenville Place, Bracknell, Berkshire, or 'phone' him on: Bracknell 21515. Interviews will be held early in September.



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£4421 — £5326 p.a.

The W.H T S.O. Computer Centro provides comprehensiv services to all Health Authorities in Wales with en-I C.L. 19048 and associated tentinals. Computer Programmers who should have at least two years service. The salary scale ranges from £4421.

C5326 per annuln.
The successful candidate will be required to work 37 hours within 5 days per week.
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a contributory supergranulation scheme is in operation. For an application form and further details write or

The Personnel Division, Weish Health Technical Services Organisation, Heron House, 35/43, Newport Road, Cardiff CF. 15B Tel. Cardiff 499921, Ext. 136, 1

Closing D. e. 11 September 1978

COMPUTER CENTRE

Welsh Health Technical Services Organisation Swyddfa Gwasanaethau Technegol lechyd Cymr



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SENIOR PROJECT OFFICER

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pry en s scale 67,074-58,730 por pun junder review)

# CONTRACTS

#### At least 2 years' OPERATIONS experience?

If you are a freelance operator now, or intend to go freelance in the near future, contact us for details of our current and future assignments in all areas of the U.K.

The ability to communicate and an intelligent attitude towards freelance work is considered essential.

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COMPUTER PERSONNEL CONSULTANTS LICENCE NO. SE(S)62

Polaroid, internationally famous for 'instant picture' cameras, film and

following people to assist in the continued developments of their expanding

Systems Designer

The successful applicant will have full project management responsibility for new applications and will work closely with user management. He/ She will be involved in joint development projects with U.S. and European Polaroid locations and some degree of travel can be expected. Recent developments include online IMS database systems in Materials Management and Personnel, with others planned for

## Data Administrator c£6,000

As part of our continuing expansion into online database systems we require a Data Administrator to be responsible for data definitions and descriptions within our systems. It is planned to extend the concepts of data-management to both manual and computer systems. This is a major undertaking for the successful candidate in a relatively new field of data

processing. He/She should have several years experience within a manufacturing environment. A data processing background which includes Cobol. IMS OS and the Datamanager Dictionary system is desirable. Training will of course be available where required.

Our modern plant is situated close to Loch Lomond and the Trossachs. The district has the widest possible hange of leisure facilities and reasons bly-priced housing is available. nousing is available.

As a sophisticated international company Polaroid ioffer a highly competitive salary and excellent conditions of employment. A generous reliccation package is available if appropriate.

Telephone Alexandria 54141 for an application form, or write to Personnel Department, Polaroid (U.K.) Limited, Vale of Leven Industrial Estate.

Dumbarton:





# MANAGEMENT & **EXECUTIVE SELECTION**

telephone 01-637 9611

# ANALYST PROGS. **Northern England**

We are recruiting on behalf of a large commercial manufacturing concern who require a number of experienced analyst programmers, preferably with Cobol in their background, to join a new team enhancing their current PDP11 network.

The positions will be based in Leeds, however, travel within the U.K. will be necessary on occasion.

Applicants should have at least 2-3 years' experience in data processing gained in a commercial environment.

A number of people with lesser qualifications and experience are required by our client to participate in their excellent in-house

The fringe benefits and career prospects within this company are excellent as is the working environment.

For further details and a confidential discussion, please contact Tony McGrath.

# SOFTWARE PEOPLE London & H. Counties £4-10k

Our client is currently seeking programmers and analysts with solid experience on any major international mini or micro such as DG Nove, PDP11, GEC 4000 and Intel 8080 series.

Professionals with practical experience of systems software work in the areas of I/O handling, disc monitors, assemblers, or high level compilers will be especially interesting, as would people with industrial systems experience on minis or micros.

A programmer with specific experience of MACRO II under RSXIIM, and I/O driver writing would be of particular interest, especially if coupled with message switching and terminal

No matter how little or how much assembler and software experience, why not discuss your situation with me.

Contact Derek Pearson.

# PROJECT LEADERS London

GET ON LINE with one of the most progressive installations in the country.

The true data processing professional will realise that 'batch' is out and distributed processing is in. Realising this you will have probably been searching for this opportunity for some time. The company for whom we are recruiting already have a sophisticated network and are now looking to enhance this further. throughout the U.K. and Europe.

Applicants for these positions will be expected to have a thorough grounding in systems analysis, preferably with a programming background, which you will have gained in a commercial environment. Whilst previous experience of project leadership would be an advantage, applicants with potential will be given every consideration.

For a full and confidential discussion, please contact Tony

## **CUSTOMER ENGINEERS** c £6k + Car Sheffield

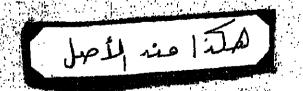
Experienced minicomputer engineers are needed by our client to maintain the sites they have in the above area.

Working on powerful modern computer systems manufactured by the company, there is considerable scope for personal development in both technical and management areas.

Being the representative of the company, it is essential that the new members be independent and conscientious, with experience of customer liaison. Technical competence is also important, but the company will be providing a thorough training on all the equipment they will be maintaining.

A company car will be provided, and there are numerous other valuable:benefits. Relocation allowances may also be av for the right person, but this is negotiable.

For a positive career with a respected company, contact Peter



MANACEMENT& EXECUTIVE SELECTION

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Shift ICL G III in installation requires an experiorized tenior ICL operator. The company
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This international company has an IBM 370 DOS/VS computer working on only 2 shifts. They offer tourific company perks including non-C PS. freeling less dis mutted insurances and four weeks hots. CW 34+B Paincia.

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# KNIGHTS KNOW HOW

**DATA PROCESSING CONSULTANTS SINCE 1970** 

#### **Support Analyst**

One of the fastest growing subsidiaries of an international mini computer manufacturer is moving shortly to brand new offices located W. London, adjacent to tube route. They are seeking an analyst to maintain a high level of back-up technical support within their group applicants should be familiar with small/ medium mini computers, with additional knowledge of IBM VS or system 3 useful but knowledge of COBOL essential

- \* Company expect to expand by 50% in the coming
- \* Excellent training in BASIC and all hardware/ software in their product ranges.
- \* RELOCATION expenses. \* Salary: to £6,500 + COMPANY CAR.

#### Analyst Programmer

Old established Merchant Bank has opportunity for person with COBOL and PL/I experience to work primarily as a programmer but also be involved with analysis -- would ideally suit ambitious programmer with desire to do more than just coding. This position is in the "investment" area but company will consider any good commercial background, DL/I Database is currently being developed, for which FULL TRAINING will be given.

- \* Large budget allocated for training purposes. \* Variety of new development including DL/I DATABASE.
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- ★ CHEAP MORTGAGE and insurance, low interest loans, season ticket scheme and excellent

Salary: £6,000.

# Snr. Programmer

Our client, an international company centrally located seeks a good programmer with sound COBOL experience. Working in a team which is principally engaged in the development of systems used to support the company's telecommunication activities throughout the world. Their equipment is ICL 1900 series but will consider other machine experience.

- \* Continued development with a well planned sche-
- \* Good promotional prospects.
- ★ Progressive organisation. \* Opportunity to learn new languages and get on to,
- \* Salary to £6,300.

Ref. 1700

#### **Programmers**

Management services division of major British group with annual turnover of almost £100m seeks COBOL programmer with minimum 2 years' IBM or ICL COBOL within a project team. Programmers will become involved in program design, coding, testing and documentation as well as assistance in systems implementation. Company offers:

- ★ Comprehensive range of applications.
- \* Opportunity to move to more advanced technical projects and variety of languages and machines. \* Paid overtime — flexi hours — subsidised restau-
- rant amongst many of the excellent perks. \* RELOCATION expenses.
- \* Salary to £5.500.

\* Ref. 1624

## Systems Analyst

Highly reputed firm of Merchant Bankers with world wide business interests are seeking Systems Analyst with either financial or insurance experience to work as a key figure within their D.P. services division. Ideal applicant should have worked in an IBM installation but any other hardware experience considered.

- \* Excellent working environment.
- \* Full banking benefits including subsidised mort-
- gage and personal loans. \* Salary: £7,500.

#### **Programmers**

A major organisation in the retail trade is now pursuing further interests at a rapid rate. Retaining NCR Century equipment with new Criterion scheduled for delivery at the end of year, they seek programmers with COBOL experience on any machine for a major system utilising TOTAL database.

- \* Plenty of new development work.
- \* Training in Database
- \* Sports and Social Club in beautiful grounds.
- heated swimming pool, squash club, etc.

  \* Excellent perks, LVS, Discount on company goods.

★ Salary to £6,250.

For further information please telephone or write to our London office: 01-734 0152/3010 (24 hrs.)

# CONTRACT DIVISION

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18:27:55

BUCKS £220 + p.w.

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PROG/DESIGNER ICL COBOL/PLAN ICL 2900 VME/B COBOL LONDON £200 LONDON £180 p.w. BEDS £230 p.w. HERTS £220 + p.w. SURREY £200

£230 p.w. LONDON .w.g+0813 N. LONDON £230 p.w.



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LUXEMBURG £350 p.w. BRUSSELS 25350 p.w. BRUSSELS £340 p.w.

HOLLAND

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**PARIS** £300 p.w. £400 p.w.

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£350 p.w.

£320 p.w.

## **Systems Analysts** to become 2900 Lecturers

£6000-£8000 Windsor

If you are a Systems Analyst/Designer

with experience in some of the following areas:

- Modern system design methods
   Communications systems • 2900 and VME/B
- Other large operating systems
  1900 or System 4
- and if you are interested in communicating your expertise to others, then we would like to be an

Join our Training Division for:

- A varied and challenging career
   Full time involvement with 2900
- Training to train others Development of your expertise
   The opportunity to travel in UK
- and overseas

#### Interested?

Ring Mary Ann Bourne on Windsor 68181 or write to be at ICE framing Division, Beaumont, Old Windsor, Berksbirg, SL4 202 quoting reference CW1952 Relocation assistance is available where:

An excellent working environme

ICL International

Computers

#### MID-GLAMORGAN COUNTY COUNCIL

**County Treasurer's Department** 

#### **SYSTEMS ANALYST**

(Commercial Project Team)

#### **SYSTEMS ANALYST**

(Borough Council Project Team)

Siláries £4245-£5568 inclusive of nationally negotiated

Commencing salaries will depend on qualifications and expenses. The authority currently operates an ICL 1904S empurerand is now actively planning for the introduction of an ICL 2972 computer next year

in 29/2 computer next year interest which exist within post teams concerned with the development of commercial splens and programs.

Assume of one year a systems expensioned is describe and splens must hold a relevant qualification. Also working bours at home or currently operating below to concern a choice of currently operating below to concern a choice of currently operating and Assume allowances and removal expenses will apply AMONAL CONDITIONS OF SERVICE.

Spication forms (to bu returned by 8 / 9 / 78) are obtainable for the County Treasurer. Mid-Ghanargan County Council, Confy Hall, Cardill GMASSING WILL DISQUALITY

Me largest IBM System 3 installation in the Midlands

#### RPG 2 PROGRAMMER

Programmer willing to learn RPG 2

Newcomputer department based in BIRMINGHAM has two System 3 Model 15 CPUs with a TP notwork serving nine locations in the UK

Interesting work, good salary and usual large company baselits.

Mr. R. G. Johnson Building Products Division Delts Metal Group Argyle Street, Eirmingham B7 STW Telephone: 021-328 0466

#### **UNIVERSITY OF MANCHESTER**

#### 2 Project Leaders

Administrative Data Processing

£6,317-£7,754 (£8,250 with effect

The Administrative Computer Unit provides a computing service to administrative departments in the University of Manchester on a 128K I.C.L. 1902T. In addition to a wide variety of batch systems, several interactive on-line systems have been developed under T.P.S. An ambitious programme of development for the next five years and beyond has been started, and to help with this the Unit new needs two additional Project Leaders.

#### 1. PROJECT LEADER - Systems

Applicants, proferably with a degree or equivalent qualification in Computer Science, should be capable of maintaining and developing extering systems software and providing technical advice to the Unit on the purchase of further software packages. Some years' experience of 1900 hardware and software, prob-in a commorcial environment, are necessary and a knowledge T P S, would be advantageous An ability to communicate offoctively with stoff at all levels is important.

#### 2. PROJECT LEADER — Data Processing

Attilicants, who should have soveral years' experience of COBOL programming and systems analysis in a commercial environment, must be able and wilting to accept total responsibility for a system from specification to implementation. A personality which will permit an easy working relationship with users is assential. A knowledge of I C.L. 1900 equipment and software would be advantageous, especially if this includes on-line experience.

Both posts will be in Administration Grade H, and benefits include a good contributory pension scheme. 30 days annual leave plus public holidays, and good meet and recreational facilities.

The University is situated near the centre of the city with a wide

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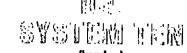
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Candidates should be qualified to at least A-level standard and should have several years' experience in computing including use of high and low-level languages and preferably some knowledge of landwave Opportunities for further training are also available. Application form from Chief Administrative Officer, North East Surrey College of Technology, Reigate Road, Ewell, Epsom, Surrey, KT17 3DS. Please quote reference: CAO/59/23.



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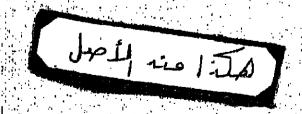
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The importance attached to this post is reflected in the salary offered and the benefits which include pension scheme, free BUPA and five weeks holiday.

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Our Client is scokeny additional professional staff with a sound RPG II background to develop systems in an ANALYST, PROGRAMMI H role: All levels of experience are required from eighteen months upwards.

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(C/78076)

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can be relied upon. Client: "We specially ordered a 'European' print-

Company, Market leading in our field - with blem."
Client: "I didn't receive

> laving some strong words with my secretary."

Salesman: "Oh dear! That's going to create some

from this tyre of cover-up is that the salesman is trying

mistakes and what is more, we all know we make mis-takes. So, that is obviously the basis on which the salesman must handle the client's reaction to errors in

How does he do it? By always blaming himself, or at least statling that he could have made some contribu-

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THE SALES BIT

## How to respond to errors of judgment

ACCIDENTS will happen! tion to the mistake being Everybody makes mistakes! avoided. This applies to These expressions roll off: whether the mistake has the tongue easily. Yet when been made by a colleague, such incidents occur they the client or, of course, the are always the source of salesman himself.
The mistake situation considerable anguish and

The salesman often finds himself in a difficult situation which has resulted what it is and has to be deute from an error in someone's with accordingly, whereas judgment. That person could be himself, a colleague or even bis client. The nature of mistakes is

such that they always come as a surprise. Areas of poscipated but not individual events, otherwise they would never occur in the first place. Certainly, problem areas, which are anticipated, tend to generate those ignored.

However, when the sales-man is "hit" with the reality of a mistake, he is usually caught unawares, particularly if the situation is than his own company.

The instinctive reaction of many salesmen is to blame some other person, organisation or situation. He needs to sustain a good and wants to avoid any factor which might impair it. After all, making a mistake is really letting someone down, and the client needs to know that the salesman

barrel and you've delivered an American one."

Salesman: "It must be the US factory, we're always having that kind of pro-

the literature you promised

Client: "I'm sorry, but gave you the wrong

roblems, I can tell you!" These kind of responses from salesmen are common whenever mistakes occur, yet their effect can be very damaging in the context of the client's regard for his supplier as a total entity. The inevitable conclusion

his best but the company is inherently unreliable. The fact is, we all do make ajways a: bitten four times shy,";

judgment of the is to lessen

receive the literature: "I'm sorry, I should have delivered it personally. in the case of the client who supplied the wrong specification, the salesman bviously cannot take the plame for the error if work

emotional. The former is

the latter has a significant

difficult to handle than the

actual problem itself. By

blaming himself, the sales-

man tends to defuse the

emotional aspect of the

So, to the client who

received the wrong print-

checked, before it was de-

spatched, it probably would

not have happened. I'm

sorry, I'll give the matter absolute priority."

And to the one who didn't

"Topsy" factor and can

has been done and has to be paid for, but he can, at least, be sympathetic and reassuring by relating him-self to the situation rather than being negative and uninvolved: "It's easily done, I might have made the same mistake myself. Don't worry, I'll do my best to

rectify the situation. This type of attitude and response can only enhance the relationship between a

salesman and his client. It is often said that we learn from our mistakes. I don't accept that philo-sophy at all. My belief is putting mistakes right. Many errors are made and left to fester. Putting it down to experience is a

andy cop-out. If a salesman is involved in a mistake, whether he caused it or not, it is his responsibility to discover why it happened, seek alternatives and ensure the situation does not occur again. That way he learns something. After all, there can be no greater embarrassment than making the

same mistaka twice. I suppose we could

#### TRADER Puzzle answer

THE Tens and Units colimns provide the vital first clue. The Units carryover must be even; and further research proves it to be 2. This cuts down the possibilities for E, and 2 is the only value which gives a valid answer for N(6).

Once 2 and 6 have been found, attention can be turned to the left hand side of the sum, and equations involving F. I. O and U may

The complete sum is in fact 40,837,226 + 4,547,226 + 79,322 + 6,582 + 726 = 45,471,062.

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An epic in 32K words, by Richard Forsyth Block 12 (Logical Block)

Despite Hex's objections, the gang have decided to deluge the System with Leibnizian Syllogistic acid, an exotic elixir distilled from a rare species of mushroom with several fascinating properties. It can be transmitted monadically along wires, and it can cause computational paralysis Meanwhile, Hex's relationship with Clay has undergoing a profound change.

Hex spent the next day with Zap, putting the finishing touches to their time sharing system. It was configured around Dr Null's microprocessor and looked really stylist once the circuit boards and power unit were tucked snugly away in their smart matt black box. They named it the M5 (Multi-modular mega-micro machine). When it was built they showed their handiwork to Cleo for her admiration.

She surveyed it coolly, without passing any comment, "Nice piece of workmanship, isn't it?" badgered Hex. "You're just building up a little System of your own," she replied — a criticism not without force.

"At least it's ours," Hex answered.
"You have to admit," added Zap with relish, "that this little contraption really has Hex appeal."
This remark was enough to lift Cleo out of her somewhat

sombre mood; and there the matter rested. The M5 passed its benchmark tests with flying colours including a version of the travelling salesman problem set in 10-dimensional hyperspace (which is where travelling salesmen should be set). It was time to bring it live.

"Who's going to be the first to try it interactively?" asked "You and Cleo," proposed Zap, "Surely, it's time you made an honest android of her."

"No thanks," objected Cleo. "I don't want J15-volt currents coursing through my head."

"Such confidence!" retorted Zap. "Let us three androids try together," interposed Lambda. "There's confidence for you," said Hex.

"I'm game." Zap assured them. They each plugged into one of the parallel interface ports and, synchronised by the 64MHz clock, logged on simult-

After they had been sitting motionless like statues for about 10 minutes, Cleo wandered out into the bowl of the



relieve the boredom she picked up a stick, procided him into wakefulness, and threw it to the far side of the crater. He fetched her first throw but the second he left where it fell and, instead of retrieving it, sniffed intently at the crater wall. He had apparently caught the smell of an animal. Cleo left him to it and ambied back to join the others.

To her surprise, not to say consternation, they were sitting expressionless exactly as she had left them. They made no response to anything she said, nor did pinches or slaps induce any of them to bat so much as an eyelid. They just sat like waxwork dummles. She was relieved to notice that the status lights above Zap's brow were green, and the red System Fall indicator on Hex's chest was not illuminated. Apart from Lambda's instruction-counter reg-

ister — which was flickering in a suspiciously cyclic pattern -- these were the only signs of life. It was clear that she had

All her life she had deliberately avoided learning about data processing. A sixth sense had warned her to steer clear of such things. But now she wished she hadn't. There were three small white buttons on the black box - marked On/Off, Load and Reset. She knew enough to realise that one false move on her part could endanger their very existence Just ripping out the informatic umbilical cords that hung from the heads of her three comrades and linked them to the machine could have disastrous consequences. Similarly, just turning the power off might well leave them in a state of computational limbo from which she would be unable to rescue them. It was a heavy responsibility.

There was only one thing for it: by a process of elimination she deduced that it had to be the Reset button, so, taking her courage in both hands, she jabbed her forefinger

A pitiful wail resounded round the cave, from three voices as from one. Hex and Zap sprang up, cracked their heads on the ceiling and, in falling, cracked their heads again against one another. They lay prostrate on the earthen floor. Lambda just collapsed backwards in a heap with a sigh like the deflation of a balloon.

"What have I done?" demanded Cleo of herself, mor-

All attempts to rouse them failed. Her heart sank. It began to look as though she had precipitated the very crisis she had striven to avoid. It was quite possible that she had broken into their co-processing in the middle of some complicated mutual interlock from which they could now never be released, leaving all three in a perpetual wait state. It was too ghastly to contemplate.

In desperation, she scrabbled round on her hands and knees trying to understand how the M5 worked; but there were no instructions and no user manual — in short, no documentation. Every time she tried to log in, it gave her rude messages about her id-code.

As a last resort, she went outside to see if Ascii could help. She did not have to search for long: he almost bumped into her as he fied, yelping in stark terror, from the animal whose spoor he had been following. As Ascii scuttled into the shelter of the cave, she could see distinctly, shinning nimbly down the sheer rock face opposite, the creature he had disturbed. It was a huge man-like ape, covered in reddish brown hair. She paused just long enough to estimate its height (it had to be eight feet tall if it was an inch) then darted back in the cave where Ascii, very

agitated, was doing his mechanical best to tremble.

All she could-hope was that the tunnel would prove too narrow for its massive bulk. It was not long before a giant shadow loomed menacingly at the entrance.

"Ne sentu timon," boomed a deep resonant voice. "Mi manghas nur vegetalojn."

Will the Abominable Snowman make a meal of them? Not Yetl. · 1978, Richard Forsyth, RAIR Timesharing.

# Keeping cool with solar film

## By Mike Gadd

turn into veritable hot-houses and one way to keep computer installations cool is by coating the windows with special solar control films which can reduce solar heat build-up to manageable propor-

worst droughts in history. ast year's blazing summer ought a host of sticky problems for anyone who worked behind large ex-

Molems were nearly all and finishes, is a transpacovering 10,000 square feet associated with personal rent polyester film which is of south-facing windows.

The problems for many computer suite managers were much more grim. Apart from the human aspect discomfort, le-thargy and a consequent ring of efficiency was the small matter of conty computer installa-tions to keep cool. Most ecomplished this by simply luming up their air-condi-tioning obsite—preferring

On an average summer's day a south-facing window generates up to 212 BTUs per square foot every hour.

With no form of protection, or means of discipation this advice of their architect. toning plants — preferring in accept the additional thing costs rather than the expense of failed with no form of protection, in or means of dissipation, this hent continues to build until the temperature behind the glass becomes almost unbearable. By apply Scotchibertiat Alf film this figure can be reduced to 54 BTUs per hour representing a reduction of 75% or so per cont in heat sain. mente de De managers were some DF managers were at affected than others. It is were the ones who is decided to do more to control their working enviousem than almply rely practically air-conditioning the stidents of Histocomputer which the special solar and like packed solar like packed so

windows, for instance - and then transmitted to the they reduced the dual windows, for instance problems of glare and solar and a reduction in air-conheat build-up to manage- ditioning costs. On the basis of current costs a saving of the costs as the costs a able proportions. of current costs a saving of Scotchint, which is £1,200 per annum can be For office workers, these available in various grades achieved on an installation

d with alumi. One leading DP company floor the temperature ntum. The density and which has discovered these colour tint of this coating is benefits is the University varied according to the application for which the film is intended but it has ing and services company. been demonstrated to reduce glare by up to 82% and solar heat transmission by a much as 75%.

In an services company that numbers some of the top companies in Europe among its clients. At their Euston Road, London, company that the control of the

trained staff on a regular basis but, apart from these routine stops, the machines

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Power for all this machitors, and most of the energy is dissipated as heat into the

meant to be 65°F and, the room itself, the controls are set for 68°F and a humidity level of 50%. Although this latter figure can safely vary by up to 6%; or 7%, the parameters for allowed.
Computer maintenance is carried out by UCC's own

are in operation round the clock seven days a week. Fallures in the air-condi-

to be reduced to 54 BTUs per hour — representing a reduction of 75% or 50 per in the tip heat gain.

The human terms this can be two medium scale DEC the hour — representing a reduction of 75% or 50 per in UCC's client centre in UCC's client centre to be the fact that the exhaust the fact that the fact that the exhaust the fact that the fact that the exhaust the fact that the exhaust the fact that the



temperature are not nearly Solar control window film, such as 3M's Scotchtint range, reduces both glare and solar heat gain dering hat weather. This installation is at the University Computing Company's utility centre in variation of ±2°F being Eastern Road, London,

within seven minutes in the installers in this instportant components within ance — with minimal distance in the machine start to burn ruption to normal office out and the whole installa- routing A18 is 0.00 in thick tion has to be shut down polyester base film coated when UCC first content with an aluminium finish

olar Control - who were

When UCC first dontenplaied installing some form
of solar control they immediately discounted specialdiately discounted specialreduction in plaie and 75%
diately discounted specialreduction in heat gain, and
divinited glass on the also aids privacy by pregrounds of cost and the time
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engineering, they were mainly interested in savings

concrete figures, I am certain that we have managed that. Certainly, there has been a drop in our running costs: in addition. of course, we have created a much more pleasant work-ing environment and